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CITY PLAN
FOR
EAST ORANGE
NEW JERSEY



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City Plan for East Orange

Essex County, New Jersey

Prepared by the
City Plan Commission

TECHNICAL ADVISORY CORPORATION

Consulting Engineers

NEW YORK

1922

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THE EAST ORANGE PLAN

INTRODUCTION

EAST ORANGE is in advance of the average city of its size in its ordinances and administration where they affect the City Plan. The City's revenue is carefully spent.

That the members of the City Council and the other city officials do a great amount of work is evidenced by the many meetings of committees in the City Hall. Obviously, it is extremely difficult for them to find the time or to get far enough away from their immediate problems to obtain the perspective needed to plan broadly for the future development of the city.

It was to fill this need that the State Legislature in its wisdom provided for the creation of City Plan Commissions. According to the statutes of 1913 it is the duty of such a commission "to prepare a plan for the systematic and future development of the city." Detached from the daily routine, without prejudice or bias, with no other demands on its time, this commission is in an ideal position to plan with vision for the future.

The City Plan Commission does not usurp or duplicate any of the functions of any existing city official, but rather it acts as a coordinating body to weave together into one comprehensive plan the most effective solutions of the various problems of each department. By a process of give and take it adjusts the various elements into a unified City Plan.

With the help of its consulting engineers, the East Orange Commission has applied the best modern scientific methods to the study of every phase of its plan. They have made a point of securing all pertinent facts; they have weighed and analyzed them without bias. For each problem they have tried to find the solution which would give the best economic return, which would give the most convenience to the public, which would secure the greatest safety and health, and would provide the most comfort and attractiveness. Many new methods of study have been evolved in the course of this work. The City Plan and Zoning Commissions have held during the last two years over one hundred meetings. The passage of the zoning ordinance completed the work of the Zoning Commission.

From time to time the City Plan Commission has presented to the City Council recommendations on urgent matters. Already the following recommendations have been put into effect by the Council:

1. A comprehensive building zone ordinance
2. Street changes in connection with the D. L. & W. Railroad track elevation
3. A modification of the Ampere grade crossing elimination project
4. The widening of Main Street roadway
5. The corner cut-off at North Harrison Street and Main Street
6. Harrison Street widening between Main Street and the D. L. & W. tracks
7. Fourth Avenue extension
8. The extension of Spring Street to Park Avenue
9. The extension of Rutledge Avenue to meet Second Avenue
10. The extension of McKinley Avenue

There are now under consideration before the City Council other street opening suggestions; also recommendations for the creation of a Civic Center facing the new D. L. & W. station between Winans Street and North Arlington Avenue, and recommendations with regard to other municipal improvements.

THE RECORD OF CITY PLANNING IN EAST ORANGE

THE first city planning commission of East Orange, Essex Co., N. J. was appointed in the spring of 1916 by Mayor Worrall F. Mountain. It consisted of:

George P. Olcott, *Chairman*
J. W. Coulston
Lincoln Bush
Richard K. Mosley

Edwin T. Murdoch, *Secretary*
✓ Lincoln E. Rowley
Willis L. Brownell
Ernest H. Bennett

In the summer of 1916, this commission retained as its consulting engineers Ernest P. Goodrich and George B. Ford. Mr. Goodrich was consulting engineer to the Borough of Manhattan and Mr. Ford was consultant to the City Planning Commission and the Commission on Building Districts and Restrictions of the City of New York. Messrs. Ford and Goodrich were, at that time, also under retainer by the City Plan Commission of Newark and had already, in that capacity, made regional plans for Essex County.

Under the legislative provisions authorizing the creation of city plan commissions, the East Orange Commission set out to "prepare a plan for the systematic future development of the city." It was soon realized that creative, detailed planning must be preceded by a thorough diagnosis of existing conditions related to the plan. The Commission therefore directed its engineers to undertake a general survey and to prepare a program of subject matter for a city plan which should cover every phase of the physical development of the city. Messrs. Goodrich and Ford, with Mr. R. F. Warner as their chief assistant, thereupon made a survey which covered the general topics of circulation, schools, parks, public buildings, municipal control over private property, and methods for the financing and administration of the city plan. The data was assembled in a report which was completed early in 1917.

This report, which contained 100 pages, 16 large data maps, and many photographs, recommended the following "Order of Urgency."

1. The elimination of grade crossing along the D. L. & W. Railroad
2. The location of a new city hall
3. The acquiring of properties for eventual park use
4. Zoning, that is the creation of different height, use and area restrictions on buildings in different parts of the city
5. The establishment of certain setback building lines
6. The establishment of better standards for the widths and types of sidewalks and curbs, and the establishment of improved curb corners, better locations for catch-basins and improved roadway crowns
7. The extension of certain streets
8. The establishment of a regular paving program covering a series of years

The City Plan Commission was reorganized on March 24, 1917, so as to include the following:

Col. George P. Olcott	J. W. Coulston
Edwin T. Murdoch	Lincoln Bush
Willis L. Brownell	Richard K. Mosley
Lincoln E. Rowley	Ernest H. Bennett

The war and its exigencies brought about a temporary inactivity for the two years following.

In the fall of 1919, announcement was made that the Lackawanna Railroad was ready to proceed with the elevation of its main line and Montclair Branch tracks through East Orange. It was realized that a complete thoroughfare plan for the city should be worked out immediately. To this end, Mayor Charles H. Martens, in March, 1920, appointed a City Plan Commission consisting of the following:

J. W. Coulston, <i>President</i>	Charles A. Heiss, <i>Secretary</i>
Richard K. Mosley	Lincoln E. Rowley
DeWitt C. Reynolds	Robert M. Crater
P. R. MacKinney	Dr. J. H. Voorhees

Dr. Voorhees resigned in July, 1920, and the resulting vacancy was filled by the appointment of Mr. Frederick Metz. On February 28, 1921, Mr. Heiss resigned as secretary to be succeeded by Mr. Richard K. Mosley. Mr. Heiss later resigned from the Commission and Mr. Louis C. Geils was appointed June 13, 1921. The present personnel of the City Plan Commission remains as thus indicated.

During its first year, this Commission held twenty-two meetings in addition to many conferences with the City Council and with other committees and commissions. Early in its existence, the City Plan Commission retained E. P. Goodrich as its consulting engineer, and directed Mr. Goodrich to collect data and present recommendations with regard to the whole subject of thoroughfare improvement. A preliminary report, with recommendations, was presented in June, 1920, and after many conferences and protracted discussion, was incorporated in a final report presented to the Mayor with a general map and five detail maps in January, 1921. Much of the subject matter of this report was also embodied in recommendations to the City Council, or to the committees of the Council. It will be found summarized in the appendix.

Early in 1920, the Mayor and Council appointed a Commission on Building Districts and Restrictions in accordance with specific legislative authorization. This Commission consisted of the following:

Wilbur S. Johnson, <i>President</i>	Hobart A. Walker, <i>Secretary</i>	
George R. Ferguson	John W. Coulston	George L. Mitchell
Charles A. Heiss	Robert M. Crater	Richard K. Mosley
John G. Scott	Henry C. Williams	W. D. Willigerod

As will be noted, four of the members of this Commission, Messrs. Coulston, Crater, Heiss and Mosley, were also members of the City Plan Commission. This interlocking membership is required by law. On July 8, 1920, at the request of the two Commissions, the City Council appropriated five thousand dollars to cover the cost of zoning, and on July 13, 1920, Mr. George B. Ford of the Technical Advisory Corporation of New York was retained as consultant. The printed tentative zoning report, containing a draft of the zoning ordinance and map, was published on November 12, 1920. A long series of statutory hearings was then held, and in January, 1921, the Commission on Building Districts and Restrictions presented its final report to the City Council. On March 14, 1921, the zoning ordinance and map were adopted by the City Council to become effective March 16. Since that date, the Zoning Commission has held several meetings to consider suggested amendments to the ordinance and map.

In December, 1920, the City Plan Commission was granted an appropriation of \$5,000 to complete a comprehensive city plan. The Commission thereupon contracted with the Technical Advisory Corporation of New York (of which Messrs. E. P. Goodrich and George B. Ford had become members) to assist them in the preparation of such comprehensive plan, it being agreed that the plan should include the following subjects:

Track elevation at Ampere	Street furniture
Complete thoroughfare and street system	Public works and services
Street-car and bus service	Coordination of plan
Civic center	Financing of plan
Parks, playgrounds and boulevards	Administration
School extensions	Program and order of urgency

Nine months was spent in a thorough study of these problems. An immense amount of data has been collected and analyzed. Many preliminary conferences and discussions have been held, and a draft of the final report was made of official record by the City Plan Commission on November 2, 1921. The present publication is an abridged reproduction of the final report referred to, together with appendices, giving, in brief, the results of various special and auxiliary inquiries.

In anticipation of this publication, certain partial reports had previously been released by the Plan Commission. For example, the plan for a civic center was presented to the City Council on April 20, 1921. This was followed by a supplementary report on July 7, which contained a financial plan for acquiring the civic center site. The general appearance of this site with proposed improvements is indicated on the colored perspective insert.

Again, in May, 1921, a comprehensive report was presented on the problem of garbage disposal. This also contained the results of a study of the street lighting problem, particularly in its relation to the use of such power as might be developed from a municipal garbage incinerator. At a somewhat later date, a special report, which is incorporated in the present publication, was prepared on the subject of parks, parkways and playgrounds.

The special street reports which were presented from time to time were as follows:

1. On June 21, 1920, a plan for improvement of the crossing under the D. L. & W. tracks at Springdale Avenue and Eighteenth Street near the Ampere station, also for the crossing at Rutledge Avenue.
2. On October 12, 1920, the original plan for the Eighteenth Street crossing was reaffirmed.
3. On June 21, 1920, a plan for the extension of McKinley Avenue as a thoroughfare across East Orange, paralleling the D. L. & W. main tracks.
4. On June 21, 1920, a plan for a foot-bridge over the D. L. & W. main line tracks at Fifteenth Street.
5. On July 27, 1920, a plan for the straightening of North Harrison Street at Main Street.
6. On November 5, 1920, that Harrison Street between Main Street and the D. L. & W. tracks be widened ten feet on the westerly side, and that the roadway be widened to thirty-two feet.
7. On January 18, 1921, that the roadway of Main Street from Winans Street to the Orange line be widened to fifty-two feet minimum between curb lines.
8. On February 8, 1921, that Fourth Avenue be extended from Grove Street to North Arlington Avenue and that North Munn Avenue be extended to meet the new section of Fourth Avenue.
9. On February 8, 1921, that a new street to be called Vanderbilt Parkway should be created between Elmwood Avenue and Tremont Avenue, parallel to Sanford Street.
10. On March 1, 1921, that the D. L. & W. tracks be raised approximately fourteen feet in the neighborhood of the Ampere station.
11. On March 22, 1921, the street system report was officially adopted by the City Plan Commission and presented to the City Council.
12. On July 7, 1921, a plan for the relocation of Hoffman Boulevard from Grove Street to Arlington Avenue.
13. On August 12, 1920, a plan for the extension of Spring Street across Park Avenue and Prospect Terrace to Carleton Street opposite the head of Lincoln Street.
14. On August 12, 1921, a plan for the extension of Halsted Street north from Main Street to William Street to connect with the Lincoln Street-Spring Street extension.
15. On August 12, 1921, a plan for the extension of Sussex Avenue through to Arlington Avenue at a point opposite the end of Chestnut Street, including the widening of Maple Terrace. This plan also included the widening of Chestnut Street and Harvard Street and their extension through to Harrison Street.
16. On November 16, 1921, a plan for a diagonal approach from the corner of Fourth Avenue and Eighteenth Street to the Ampere station; and moving Belgrade Avenue one hundred feet to the west so as to leave a continuous line of lots one hundred feet deep between it and the D. L. & W. tracks, from Norman Street down to Rutledge Avenue extension.

With a view to meeting such expenses as will arise in carrying forward the various recommendations of the City Plan Commission, an appropriation of \$2,000 has been asked for in the municipal budget of 1922.

GENERAL STATEMENT

CITY PLAN FOR EAST ORANGE

NATURAL PHYSICAL CONDITIONS

THE City of East Orange is in the center of Essex County; its area is about four square miles; it is ten miles west of New York City and lies north and west of the City of Newark. It is crossed by the main line and the Montclair branch of the Lackawanna Railroad and by the Orange branch of the Erie Railroad. The topography is slightly rolling. East Orange contains no ponds and only three small streams, two of which are already being covered. The city has practically no water supply within its borders. The wooded tracts have almost entirely disappeared. There is no farming, except for a few market gardens. The climate, temperature, humidity and prevailing wind conditions are the same as those throughout the metropolitan New York district. There is scarcely any natural scenery left in the community.

FUNCTION AND HISTORY

East Orange is a high-class, suburban residential community. Until recently, it consisted almost exclusively of single family houses on relatively large lots, nearly all of the streets being bordered by fine old shade trees. The houses were set well back from the street line. Within recent years, a few rather large industrial plants have developed along the railways, and other smaller plants away from the railways. Since about 1910, approximately 100 apartment houses have been built, from four to eight stories in height. These apartment houses have spoiled one good residential block after another, depreciating property values in their vicinity and thus eventually forcing the city to control by ordinance their location and size.

East Orange is now a city of the second class. It was set off from the old Town of Orange on March 4, 1863. In 1899, East Orange became a city with five wards. The boundary lines of these wards were changed in 1921. Streets of East Orange are continuous with those of the surrounding communities along each of its boundary lines, so that there is only an arbitrary line of demarcation between East Orange and these other cities and towns. Their various problems are closely interrelated and must be studied in common. There is no area that East Orange could possibly annex from the surrounding communities.

POPULATION AND RACES

The population of East Orange in 1863 was 3,000; in 1900 it was 21,500 and in 1920 it had increased to 50,710. The detailed study of the city's population, con-

tained in the Appendix, indicates that the number of inhabitants would be about 122,500 by 1971. The provisions of the recently enacted zoning ordinance will establish a check at a somewhat lower point than would naturally be reached, and are likely to limit the ultimate population to about 125,000.

The chief point of present congestion is in the rapidly growing apartment house section near the center of the city. There are two Italian sections in the southern part of the city and four scattered, small groups of colored people near its center. The Italian sections show the highest birth rate of any part of the community. Until recently, the majority of the male inhabitants of East Orange have been commuters to New York or Newark. The wage-earning population in the southern and eastern parts of the city is now growing rapidly. The greater part of this population walks or uses street transportation lines to reach the factories in Newark, Bloomfield or the other Oranges.

INDUSTRY, TRADE AND WEALTH

Commerce in East Orange is confined largely to local retail trade, although certain East Orange stores are patronized by shoppers from the neighboring communities. Business is limited to a few main streets. There is very little wholesale business or warehousing. The industrial plants, which are mostly along the Montclair Branch of the Lackawanna Railroad, include a large bakery, two metal working establishments, two large electrical appliance factories, a plant making surgical supplies, two making concrete products and about twenty smaller industries, many of which are machine shops. Their market is general and their labor is largely skilled. There are five or six lumber, wood and coal yards located in almost every case along the railroad tracks. Construction activities are handled by the contractors of East Orange and Newark. The public utility services of East Orange are supplied by plants located outside the city limits. Street transportation service is afforded by three trolley lines and three bus routes.

The tax rate in East Orange for 1921 was 3.25. The total assessed valuation of property was \$68,993,384. This is generally assumed to have been the full valuation, but properties in the center of the city sold during the year for double their assessed valuations. As will be seen from the City Plan Map accompanying this report, land values, on the average residence block, are from twenty to fifty dollars per front foot, while on the principal business corners, values reach several hundred dollars per foot.

Probably half of the total area of the city is still available for building. Land values are reasonably stable except where specifically impaired by the intrusion of apartment houses, public garages or factories.

FOOD AND HOUSEHOLD SUPPLIES

The food consumed in East Orange comes principally from the wholesale markets and commission houses in Newark, Jersey City and New York. There are only a few market gardens in or near East Orange. Most of the foodstuffs are brought to the city by truck. There are no public markets, and there is very little

food storage or cold storage within the city limits. This lack of storage facilities applies to household supplies generally, with the result that East Orange has and can have no problem of food supply separate from that of the metropolitan district as a whole.

STREET TRAFFIC

A number of counts of street traffic have been taken by the transportation companies and by the consulting engineers of the City Plan Commission. The analyses of these studies show that most of the traffic is directly through the city from north to south or from east to west. The traffic problem therefore resolves itself into an examination of the adequacy of streets in these two directions. No special diagonal or cut-off streets seem to be required to meet traffic needs. The most congested thoroughfare is Main Street, in the Brick Church district. The roadway in Main Street is now being widened. Sidewalk encroachments on a few of the busiest streets are being removed. The flow of traffic on many other streets could be improved by the same means.

Most of the streets are fifty feet wide, with roadways from twenty-six to thirty feet wide—just too narrow for four traffic lanes. Unfortunately, few of these roadways can be widened, on account of the existence of large trees located next to the curb. The street grades and street paving are uniformly so good that they have very little retarding effect on traffic. Except on Main Street, the street car lines have little adverse effect on the speed and convenience of street traffic. For some time there have been three bus lines in operation. Recently one was discontinued and a new one was added. The bus routes are regulated by the city, and do not interfere with traffic. There have been remarkably few street accidents. Traffic policemen and traffic signal control have been installed on a few of the principal corners. There are no “one-way” streets.

PARKING OF VEHICLES

There are few large office buildings or department stores in East Orange. Hence there is little serious problem in connection with the parking of automobiles. The greatest congestion due to parking occurs at certain times around the East Orange and the Brick Church stations of the Lackawanna Railroad, with a somewhat lesser congestion around the Grove Street and the Ampere stations. There is often bad congestion around the high school building, the larger stores and banks, the principal clubs, the larger apartment houses, the motion picture houses and the churches. Although there is a large number of public garages on or near Main Street, in the center of the city, they are little used for day-storage. These, and the many large group garages, are used to their full capacity for permanent storage. Around the railroad stations and the public and semi-public buildings, additional special parking facilities are suggested by increasing, wherever feasible, the widths of the roadways; by utilizing the spaces underneath the new railway station, and by the creation of opening park spaces near the site of the proposed City Hall, the proposed Post Office and the new high school building.

THOROUGHFARE SYSTEM

As is indicated in the Appendix, an exhaustive study has been made of the whole thoroughfare system of the city. Wherever it was found possible to handle the growing traffic by simply widening the roadway, this has been recommended as the easiest and most practicable method. In order to save the trees which border many of the streets, the Commission recommends that parking spaces be provided in pockets between the trees, so as to release the present roadway width largely for moving vehicles. In many places the only possible thoroughfare streets are now only fifty feet wide, and it was found necessary to recommend the widening of both the street and the roadway, properly to handle the growing traffic. In other cases, the existence of exceptionally deep blocks suggested the possibility of opening new streets, not only to improve the traffic situation, but also with a view to creating new land values and attractive building sites along the new streets.

Recommendations have been made to round off various sharp corners at intersecting streets, in order to speed up traffic and at the same time to reduce the danger of accident. In all cases, each of the various alternative possible solutions of the specific problem was studied in detail to discover the total effect and thus to permit of intelligent comparison. As a result of these studies, some apparently attractive suggestions for new thoroughfares had to be rejected because the final estimates indicated that the projects would involve undue expense.

All of the new thoroughfares finally recommended, with reasons for the recommendations, are described in the Appendix, and are shown on the City Plan Map. Some of these recommendations have already been adopted by the City Council and are now being put into effect, and others are under consideration.

MINOR STREETS

The Appendix to this report exhibits in detail a number of recommendations for the cutting through of new minor streets—in almost every case, through the interiors of deep blocks. The location of these streets was determined not only with a view to facilitating traffic in the neighborhood, but also in the interest of the creation of new ratables, thereby increasing tax revenues available to the city. As in connection with the thoroughfare system, a detailed study was made of all methods for the solution of each individual problem, in order to ascertain which solution would give the maximum return to the city. All of the ultimate recommendations are incorporated in the City Plan Map. Several have already been adopted by the City Council.

Where these proposed streets would obviously always be used only for local traffic, narrow roadways have been recommended, so as not to burden the city and the abutting property owners with excessive improvement costs.

There are no new sub-divisions to be laid out in East Orange because there is no area left large enough to sub-divide. Provision has been made for the eventual widening of each of the newer streets by setback restrictions incorporated in the Zoning Ordinance recently enacted. With a view to securing a high type of devel-

opment, the land bordering each of the new streets has been laid out in lots at least 50 feet wide and 100 feet deep (usually 125 to 150 feet deep).

TRANSIT LINES

The only street transit lines in East Orange across the city are from east to west. Almost every public and semi-public building, and the churches, stores and motion picture houses, are readily accessible on foot from all parts of the community. The chief use of the trolley lines is as a means of going to and from Newark. The Appendix to this report shows that the volume of street car travel in East Orange is far less than the average. With so small a demand for street transportation, those added facilities which are required in a northerly and southerly direction will best be provided by motor buses. The Commission accordingly recommends the establishment of additional bus lines, as shown on the City Plan Map and as described in the Appendix. The new Grove Street bus line from Irvington to Bloomfield, which was started several months ago, should serve as a valuable feeder to the railroads and street car lines.

RAILWAYS

There are no new railroad problems in East Orange. The Lackawanna Railroad is now elevating its tracks through the city. The Erie Railroad runs infrequent trains through a sparsely inhabited part of the city. Neither railroad is likely to consider the erection of new stations, or any extensions through the community. There is no special problem of relocation or straightening. There is no possible consolidation of facilities. The four existing station locations on the Lackawanna and the two stations on the Erie should be preserved. It seems probable that the Lackawanna system will be one of the first in the New Jersey commuting zone to be electrified.

BRIDGES AND GRADE CROSSINGS

There are no tunnels in East Orange and no bridges or viaducts except those along the railroads. The elevation of the Lackawanna tracks will remove every grade crossing in the city along each of its lines. There has never been a fatal accident at any of the ten grade crossings of the Erie tracks. A detailed computation, exhibited in the Appendix, shows that the value of the time that would be saved each year, by the elimination of delays to vehicles at the grade crossings of the Erie, would probably not amount to more than \$30,000. A complete study has been made of the various possible methods of elevating or depressing the Erie tracks. A comparison of the minimum cost of carrying out these plans, as compared with the present loss of time to the community, shows that the expense involved in elevating the Erie tracks will not be warranted for many years to come.

With respect to the elimination of grade crossings on the Lackawanna, the City Plan Commission made a number of recommendations, many of which were adopted in the plans now being carried out. Where Eighteenth Street and Springdale Avenue cross the Montclair Branch of the Lackawanna at Ampere station, the

Commission strongly recommended direct crossings of these two streets instead of the tortuous combined crossing proposed by the railroad. While the direct crossing plan would have been far safer and more economical in operation, the Lackawanna plan (as modified by the Commission) was eventually adopted to save money. The relative advantages from the traffic standpoint of the two plans are illustrated in accompanying diagrams.

AVIATION

There is, at present, no aeroplane landing field in East Orange. Until it becomes practicable to land and launch aeroplanes in a much smaller area than is now required, it will be impossible to provide a landing field within the limits of the city. There is no area large enough today, and such partially adequate areas as exist are rapidly being cut into by improvements.

STREET CONSTRUCTION

As will be seen in the Appendix and from the accompanying sample tables, a detailed study has been made of all features of construction of the city streets. It is proper to state with all possible emphasis that great credit is due the City Engineer for the exceptionally competent way in which he has handled the public improvement program of the city. In fact, most of the improvements in street construction and related matters, which have been recommended by the Plan Commission and its consulting engineers, would have been developed by the City Engineer if he had had the necessary organization and facilities at his disposal. There are presented in the Appendix a number of specific recommendations based on observed conditions, among which special emphasis should be laid on the gradual replacing of the usual macadam or telford pavement with an asphaltic surface on a concrete foundation. It is recommended that the City Engineer's office prepare a comprehensive paving program on the basis of an agreed definite annual budget allowance for pavement reconstruction and improvement.

Gutters throughout the city are well designed. Few need repair. Most of the streets in East Orange have block stone gutters. It is recommended that smooth (concrete) gutters be substituted whenever streets are repaved. Most of the curbs are of sectional granite or flagstone and stand exceptionally high above the gutter. It is recommended that these be gradually replaced, in necessary cases, by curbs of lower height. Pavement crowns are also often too high.

A review of types and condition of sidewalks discloses extreme heterogeneity. The Commission recommends that the City Engineer's office prepare a comprehensive sidewalk construction program to be carried out over a series of years.

SUBSTRUCTURES

Wires have been buried in East Orange on a few of the principal streets; on other streets, they are located inconspicuously along rear lot lines so that poles are not as obtrusive as they are in many communities. There are water mains under nearly every street, and gas mains in most of the streets.

The sewer system is of the separate type, nearly the whole area of the city being covered by sanitary sewers and, wherever necessary, by storm sewers, the only real problem in this connection is that of the size of sewer in relation to the load to be carried. This is discussed in detail in the Appendix.

WATER SUPPLY

The Orange Water Company was organized in 1880 with franchise rights to supply water throughout the township. The first service was from open wells of large diameter in the eastern part of the township. On January 1, 1903, East Orange bought the distributing system of the Orange Water Company within the city limits. In the same year, the city bought a source of supply in the White Oak Ridge section of Milburn, west of Second Mountain. The city now owns there about forty artesian wells yielding approximately 4,000,000 gallons per day, and also a 5,000,000 gallon storage reservoir on the side of South Mountain in South Orange Village. The quality of the water is as good as that of any municipal water in New Jersey. The service is excellent. The per capita consumption is 61½ gallons daily.

SEWAGE DISPOSAL

There were no public sewers in East Orange prior to 1885. In 1888, about five hundred houses were connected with sewers and a disposal works was constructed. This disposal plant was abandoned about fifteen years ago, and the property on which it was located became part of Watsessing Park.

The Commission's study of the sewer system, as described in detail in the Appendix, indicates the existence of various points where the present mains, especially those ten inches in diameter and larger, have become inadequate. The points most in need of early attention are specifically listed. A similar study, made of the existing storm sewers and of the rapidly growing impervious areas in the city, resulted in the determination of several sections where such sewers should be enlarged in the near future. After estimating the probable future population of the community and its requirements and considering the relative costs of the various sizes of sewer mains and the carrying charges on the capital that might be invested in each size of main, it was concluded that (other things being equal) it has been more profitable to build a smaller sewer than would ultimately be necessary, and to replace it with a larger one at the end of twelve or fifteen years, than to build the eventual sewer at the beginning. Hereafter, however, in view of the general upward trend in commodity prices, the Commission recommends that the largest eventual equipment be considered each time that an existing sewer is replaced.

GARBAGE, WASTE AND SNOW REMOVAL

Street cleaning and snow removal are now handled effectively by the Engineering Department, considering the funds available. The question of the disposal of garbage, ashes and refuse is much more difficult. The City is paying a large premium for the removal of garbage beyond the city limits. The dumping of even

clean ashes within the city limits will not be possible much longer. The Appendix brings out clearly the fact that incineration is the one method for disposal of garbage and refuse that is practicable under the circumstances. Steam generated from the burning of garbage and refuse can be used to generate power for light or to manufacture ice, but the value of the steam can never equal the cost of incineration. The incineration of garbage alone is all that East Orange should attempt now. Improved separation of garbage from ashes, at the source, should therefore be attempted. East Orange produces from 12 to 40 tons of garbage daily, according to the season. The present total cost of hauling it away is \$5.75 per ton. The cost of hauling to a centrally located, model, odorless incineration plant is estimated to be \$2.32 per ton. The cost of incineration would be \$2.34 per ton. Hence the total expense with incineration would be \$4.66 per ton as against the present cost of \$5.75 per ton for long distance hauling. The difference would amount at \$7,957 per year on the total amount hauled. This is after including a fair rate of interest on the plant and a sufficient amortization charge. The difference between the present method and the proposed method will increase as the city grows. A modern incinerator plant can be erected for about \$115,000 plus \$12,000 for the cost of the necessary land.

A steam boiler, operated by the heat from incineration would be adequate to heat the proposed City Hall and other public and semi-public buildings in the center of the city. During the summer, spring and fall, enough electric current could be generated to illuminate the whole of Main Street in a modern, satisfactory manner. The electric generating equipment with connections would cost about \$25,000 additional to the cost of the incinerator.

LIGHTING

The City of East Orange is lighted by 2,062 single Welsbach gas lamps, 23 triple Welsbach gas lamps and a few open flame gas lamps, or a total of 2,220 units aggregating 93,509 candle power. The recent report of the Street Lighting Committee recommends replacing these gas lamps by 2,180 electric lighting units aggregating 632,900 candle power. The Appendix to this report contains a comparison of present lighting equipment in East Orange with those in other cities both smaller and larger, and indicates that East Orange stands about at the bottom of the list with respect to the candle power per mile of street and the candle power per capita. The proposed system would bring East Orange to a normal rank in both respects. On the other hand, a more elaborate comparison of the intensity and effectiveness of the proposed lighting system of East Orange with those of other cities shows that the proposed system will be below the average with respect to the number of foot-candles along the center lines of streets. It is therefore recommended that, instead of the proposed cluster lamps, there be used modern single units designed for the maximum effective diffusion of light. The same candle power as that now proposed would then give a considerable increase in the amount of useful light. Otherwise the proposed system for East Orange is excellent in its character and distribution.

WELFARE AND SANITATION

The Board of Health was organized in 1885. By the census of 1910, East Orange was shown to be the healthiest American city. Malaria is practically unknown. The Essex County Mosquito Commission has virtually cleaned up the mosquito nuisance throughout the county. A regular inspection is still maintained. Medical inspection in schools shows a remarkably clear record. The birth rate is 17.4. The death rate is 11.0, about the lowest in the country. Deaths from tuberculosis are only 5 per 10,000. A new sanitary code was adopted by the Board of Health on June 3, 1920.

There are no public hospitals and few welfare institutions in East Orange. Use is made, however, of such institutions in Orange and other nearby communities. Such excellent care is being taken of welfare work by existing agencies that no recommendations need be made from the city planning standpoint.

HOUSING

In September, 1915, Miss Edith Wrigley Hall, Field Secretary of the Civic Committee of the Woman's Club of the Oranges, published a report on "House Conditions in the Oranges." This report demonstrated that housing conditions were not bad in any of the four Oranges. The houses were in general well supplied with toilet facilities and running water. Only a very small proportion of dark rooms were found to exist, and these were all in old houses. However, the rapidly growing Italian district in the southern part of East Orange is tending to develop unduly congested conditions. These will be partially checked by the light and area provisions of the recently adopted Zoning Ordinance and by the domestic animals, housing, nuisance, and plumbing and drainage provisions of the new Sanitary Code of the city. The cultivation of gardens in rear yards should be encouraged. There are several hundred tenement houses in East Orange, but (fortunately) few of them house more than three or four families. The Zoning Ordinance prohibits the erection of buildings for more than two families in most of the alien-inhabited sections of the city. A few rear dwellings exist, but the Zoning Ordinance prevents the erection of any new ones. There are almost no blind alleys in East Orange. The organization of housing companies, to build for workingmen model homes that can be leased or sold at a reasonable price, is strongly recommended.

PUBLIC COMFORT STATIONS

East Orange has no municipal public comfort stations. It is one of the few cities of its size in the country that is without such facilities. Most modern cities have at least one comfort station for every thirty to fifty thousand of population. They cost anywhere from \$1,000 to \$50,000 each, the average being about \$20,000. Maintenance costs are from about \$8,000 per year down to \$1,000 per year, with an average of about \$2,500 per year. East Orange is peculiarly fortunate in having four new railway stations in the center of the city, each with public toilet facilities. The city is also providing toilet facilities in several of its larger playgrounds.

SCHOOLS

As will be seen in the Appendix, the Board of Education, which is an organization independent of the City Council, had assigned for its uses the sum of \$600,000 in 1920, or 31.6 per cent of the total tax levy. There are nine grammar schools and one high school, and sites have recently been purchased for a junior high school building, another grammar school, and a gymnasium. In June, 1921, there were 6,110 pupils in the grammar schools, and 1,465 in the high school. The grammar school pupils constitute 12 per cent of the total population and the high school pupils nearly 3 per cent. The Board of Education has two problems to consider: first, the extension of its school plant; and second, the provision of adequate school-yard playground space; this latter problem is discussed under the heading of *Playgrounds*.

The detailed studies of population trend contained in the Appendix show that the present nine school districts will have to be increased to fourteen during the next thirty to forty years. This will correspond with an eventual population of from 6,000 to 11,000 people in each of the fourteen districts, or from 600 to 1,400 students in each eventual elementary school building.

A study of the eventual Population and Distribution Map, the Zoning Map, the Unimproved Property Map, the Unit Land Value Map, the Thoroughfare Map and the Street Transportation Map leads inevitably to the following recommendations:

1. Purchase, within five years, a two and one-half acre site in the middle of the block just west of Evergreen Place and north of Central Avenue (See City Plan Map)
2. Purchase, within seven or eight years, such land as may be necessary to enlarge the Elmwood, Nassau and Ashland school buildings
3. Enlarge, within ten years, the Franklin school building, and at the same time take over the proposed junior high school building as an extension of the high school plant
4. Purchase, in about ten years, the Soverel Terrace tract
5. Erect, within fifteen years, a school building on the Renshaw Avenue site
6. Purchase, within fifteen years, the Summit Avenue site

This program, if carried out, should so take care of the school requirements of East Orange that no particular revision of plan will be necessary for at least fifty years.

COMMERCIAL AND PRIVATE RECREATION

East Orange has six motion-picture theatres. It has no amusement parks, no race-tracks and no baseball parks other than those in the public playgrounds. There is one private tennis club, but no golf course. There is no Y. M. C. A. or Y. W. C. A. building within the corporate limits of the city. All these customary facilities for commercial and private recreation exist in the surrounding communities and are used by East Orange people. The effective development of public recreation facilities in East Orange makes it the less necessary to promote private or commercial recreation enterprises.

PLAYGROUNDS

The first Recreation Commission in East Orange was formed in 1907. In that year, the East Orange Oval was purchased for \$52,000. In 1909 the Recreation Commission took over from the Board of Education, for summer operation, five school yard playgrounds, and also the Ashland Athletic Field, which has since been developed with a stadium built by private subscription. In 1909, Elmwood Park was taken over. Nearly \$200,000 has been spent on this enterprise. Still more recently the Recreation Commission has acquired the Columbian Playground.

In conformity with modern playground practice throughout the country, playgrounds for children under ten or twelve years of age are being provided usually in connection with the schools and are so distributed that no child is required to walk much over a quarter of a mile to reach a playground. Several large playgrounds or playfields, much more widely distributed, are being provided for the older children. As facilities of this class, Elmwood Park, East Orange Oval and Columbian Playground provide all the space necessary for the present and the future, in the eastern and southern parts of the city. The Appendix shows that a tract of at least seven acres should be found, centrally located with respect to the northwestern part of the city, to provide adequately for that section. To this end, the Commission after much study recommends the purchase within ten years of the present tennis courts on Glenwood Avenue, starting 150 feet north of Park Avenue.

There are about fourteen net acres of available playground space in connection with the nine grammar school buildings. Nearly 3,000 younger children have no place for summer play. After thoughtful study, the Commission recommends the program of nine items which is outlined in the Appendix.

PARKS AND PARKWAYS

East Orange has no parks of its own. The Essex County Park Commission has jurisdiction over six and one-eighth acres of Watsessing Park and over a fraction of an acre of Orange Park, within the municipal limits of East Orange. It has jurisdiction also over about a mile of parkway known as East Orange Parkway; and over Park Avenue. The other so-called parks in East Orange are, strictly speaking, playgrounds or playfields; and are under the control of the Recreation Commission or of the Board of Education. Within the limits of East Orange there are in all only about 27 acres of parks and playgrounds, or 1 acre for each 2,000 inhabitants. Of strictly park land, there is only 1 acre for each 8,000 inhabitants. The average throughout the larger cities of the United States is 1 acre for each 350 inhabitants. There are various other county parks, located at distances of from one-half mile up to several miles beyond the city limits.

In 1921, East Orange contributed \$34,700 of the \$400,000 spent by the Essex County Park Commission. Allowing one-half of this for maintenance of the county parks, at least \$17,000 a year should be available for park development within the limits of the city. The Appendix shows that in equity the County Park Commission owes the city from 50 to 100 acres of park and parkway. New parks should be so

distributed that they will be within easy walking distance for mothers and children in each part of the city. They should be connected by parkways, or at least by tree-planted and grass-bordered streets of ample width. Fortunately, the Building Zone Ordinance imposes setbacks and requires front yards so as to prevent for all time the erection of buildings near the street line. This will make an eventual expropriation relatively cheap for the city.

The city should not have to pay for parks or parkways. A detailed plan is presented in the Appendix for so locating and laying out a parkway system as to make it largely pay for itself because of the excess of betterments over damages, increased ratables being created by the improved frontage or by nearness to the new parks and parkways. A special study has been made in this connection of the possibility of opening new roadways through the centers of deep blocks. By this device, the parts of the parkway system which could be made to pay for themselves would be taken care of by the city without increasing its budget; while the connecting links and the less profitable parts of the system should be financed and maintained by the County Park Commission.

The final recommendations of the City Plan Commission with respect to Parks and Parkways are set forth in full in the Appendix and incorporated in Fig. 11 and in the City Plan Map. As proposed, the immediate outlay necessary to inaugurate this program is only \$125,000, of which \$85,000 should be assumed by the Essex County Park Commission. The annual outlay on the part of the city for its share of the complete system should not exceed \$15,000, of which one-half to three-quarters may be assessed against the benefited properties. The complete system should create nearly two million dollars in additional ratables.

LANDSCAPE ARCHITECTURE

East Orange is remarkable for its tree-bordered streets. The variety of trees is unusually great. The Shade Tree Commission has done exceptionally good work in the planting of new trees and the systematic upkeep of existing trees. In 1920, 100 trees were planted at the request of property owners, and 31 others were replaced. There were 23 poplar trees removed, as well as 62 of the 300 Oriental plane trees that had been killed by frost. Most of the recent plantings are of Norway maples. The Shade Tree Commission has an appropriation of \$13,000 a year. Fortunately, the general policy has been adopted of gradually replacing the various kinds of trees in a block by kinds so selected as eventually to make the street uniform in character. Most of the trees, even in new plantings, are spaced too near together; 40 feet between trees is considered the best modern practice in order to allow for ample development of the lower branches. The staggering of trees on opposite sides of the street is to be recommended.

Parking strips are, in general, well kept up, but they are usually too narrow. This does not allow for a reasonable growth of the trees and their roots. The result is an upheaving of the flag sidewalks. For the proper ultimate growth of trees, six-foot parking strips would not be too wide.

CIVIC ART IN STREETS AND PARKS

There is but one statue and there are no other ornaments or works of art in the streets or parks of the city. Very little has been done in the way of architectural approaches or settings but (thanks to the generosity of Mr. Alden Freeman) Elmwood Park, designed by an East Orange architect, affords an interesting example of playground setting.

The design of the existing lighting fixtures in East Orange is distinctly bad. The hydrants, police call boxes, fire alarm boxes, letter boxes, waste cans, billboards, street poles, street name signs and traffic signals, all cry for improvement in the quality of design. It is strongly recommended that local architects take these matters in hand. The City Plan Commission or a separate Art Commission should be required by law to pass on the design of every structure erected in the streets or on other public property. Along principal business streets, such as Main Street and Central Avenue, much might be gained in orderliness and attractiveness if the various business men would organize in street associations, having a consulting architect, with the purpose of influencing the designs of new buildings erected along a street, so that eventually the whole street would be harmonious in character and appearance.

CIVIC CENTER

The East Orange City Hall is rapidly becoming more and more inadequate. A new city hall must be built soon. Plans have already been drawn for a new junior high school building, a new post-office building and a high school gymnasium. A new railway station is now being built near the post-office site. A war memorial is about to be created. Unless plans are coordinated, each of these structures will be built on an isolated plot and the opportunity for an impressive cumulative effect will be lost. Such an effect would be secured by the effective grouping of these buildings in a civic center. The cost of the combined group need not be any greater than the sum of the costs of the separate edifices. No such opportunity can ever again come to the city.

The Appendix contains the City Plan Commission's comparison of the good and bad points of the nine possible sites for a civic center near the center of the city. The "Weighted Average" table shows conclusively, by the process of elimination therein adopted, that the one best site is that fronting on the new Lackawanna station plaza between North Arlington Avenue and Winans Street. The front of this property, 125 feet deep, is now owned by the railroad, with the exception of two house properties on Winans Street. The new federal post-office site faces toward this civic center on the east; the new junior high school site fronts it on the north, and the new railroad station on the south.

The colored perspective view accompanying this report shows the proposed general mass and composition of a civic center on this site, with the proposed new city hall in the center, fronting on a war memorial plaza, there being a forecourt and monument between the plaza and the railroad station.

Obviously, the complete site would cost a large sum of money. It is quite

apparent that the city cannot afford to purchase the whole site at the present time. Hence (see the Appendix) a detailed program is offered for the gradual purchase of the necessary properties over a period of years. This is modest in its requirements as to bond issues in any one year, yet it is so arranged as to give control of the complete development from the beginning. The Appendix also shows how it will be possible for the city to continue to derive sufficient revenue from existing buildings within the proposed center to pay most of the carrying charges on the property until such time as actual construction begins on the city hall and the memorial forecourt. The latter construction should preferably be undertaken in cooperation with the War Memorial Association. The possibility of utilizing this site affords a unique opportunity for East Orange, and the project is rendered practicable by the plan of acquisition in instalments.

BUILDING DISTRICTS AND RESTRICTIONS

East Orange, a charming city of detached homes, began to be seriously invaded ten or fifteen years ago by apartment houses and garages. So serious had the menace become, that in the spring of 1917, the City Plan Commission recommended the creation of a Commission on Building Districts and Restrictions. This recommendation was repeated in the report of the Plan Commission's preliminary survey early in 1920. A Commission on Building Districts and Restrictions was appointed in June of that year. With the Technical Advisory Corporation as its consulting engineers, the Commission proceeded to make a very thorough collection and analysis of all the facts related to zoning, as indicated in the Appendix, and then, after a long series of meetings and hearings, presented a tentative report, in November, 1920. In January, 1921, its final report was rendered to the City Council. The Council, without a dissenting vote, adopted the zoning ordinance and maps after incorporating certain modifications which had resulted from the public hearings. The Commission on Building Districts and Restrictions has continued in existence for the purpose of advising the Council on petitions for amendments to the ordinance and map. During the summer of 1921, in accordance with the terms of the ordinance, the Mayor appointed a Board of Appeals to interpret and temper its administration in cases where it might be likely to cause unnecessary hardship.

Since the zoning ordinance went into effect, the Building Inspector has dealt with a greatly increased number of applications for building permits for one and two-family houses. There has been a notable improvement in the market for the sale of unimproved property, as well as of homes. The public good-will created by the success of zoning has materially helped to further East Orange's general program of city planning.

BUILDING, GARAGE, SMOKE AND SANITARY ORDINANCES

The present building code of East Orange became effective in April, 1910. It is inadequate to meet modern conditions. The Building Inspector is now drafting a revised building code with occasional advice from the consulting engineers of the

City Plan Commission. A garage ordinance was passed on September 14, 1917. This ordinance is being incorporated in an improved form, in the revised building code. In 1916, the City Council passed a revised ordinance regulating the emission of smoke from chimneys. On June 3, 1920, the Board of Health adopted a model sanitary code which will take care of the needs of the city for some time to come.

FINANCE

A municipality must pay its own way. Most public improvements benefit adjacent properties more than they benefit properties farther away. When the improvement does not cost a very large sum it is most economical to include its cost in the amount which is assessed annually for expenses of general community administration. Otherwise the cost of collection is likely to be disproportionately large. The greater part of this amount is assessed on real estate, because real property cannot be hidden, transported or destroyed, and can be measured as to extent and relative value with reasonable facility and accuracy.

Large public works cannot be paid for out of the tax levy of a single year without causing great irregularity and even distress. Landlords cannot often increase rents to meet sudden upward fluctuations in assessments or tax rates. The benefits resulting from large improvements will usually be enjoyed over a long period of years. It has been the general practice to issue bonds to pay for such improvements. Obviously, such bonds should be retired by means of sinking funds or serial payments. The life of the bond issue should never be as long as the life of the improvement for which it pays. The charges on these bonds should be paid, as far as possible, by those most benefited as a result of the improvement.

Recent experience proves that for most purposes serial bonds are preferable to a sinking fund. A community largely made up of wealthy taxpayers can afford to carry a heavy bonded indebtedness with a correspondingly high tax rate, while a community with less average wealth had best follow more nearly a pay-as-you-go policy.

It is logical and proper to levy local assessments for public improvements which are primarily of local benefit, such as a sewer, a secondary school or playground, or street paving. Where a single levy would be onerous, arrangements are usually made to permit of optional payment in several instalments with discounts for a single full payment. The larger proportion of the cost can be assessed on the immediate abutters. Other neighboring property (within a radius to be specially determined in each case) can be assessed part of the cost. The latter part is usually considerably less than the part assessed on the immediate abutters.

The city itself reaps a benefit from the increased ratable value of benefited neighboring properties; but if the city's benefit were confined to this alone, its share in the increased values created by its own improvement would be disproportionately small. This has led to the legalizing, in several states, of a policy known as "excess condemnation." This policy involves the purchase by the city of surrounding property, additional to that actually needed for an improvement; such purchase to be followed by the sale of any excess property after the benefits of the improvement

have increased the value of all surrounding property. A constitutional amendment to legalize excess condemnation was submitted to the New Jersey Legislature several years ago, and lost. It should be resubmitted by the City Plan Commission and passed. The states of Massachusetts (1911) and Wisconsin (1912) have granted this power to cities.

The New Jersey Laws of 1920 permit the issue of bonds up to 7 per cent of the total ratables of the city. Conservative bankers rarely accept New Jersey city bonds based on a ratio above 6 per cent. The only practicable way of marketing bonds for the remaining 1 per cent is by sale to local banks or "over the counter" to citizens. This latter method has attractiveness because of its influence in arousing public spirit.

It is found after some attention to the subject that the taxes in East Orange are assessed with more than average equity. However, enough individual instances of inequity have been discovered to warrant following the example of several other progressive cities in the appointment of an equalization committee to review the work of the tax assessors. When carried out under expert guidance, there have usually been found various excessive assessments that could be reduced, untaxed plots that could be placed on the books and favored parcels that could be brought into line. The result has generally been an increase of total ratables, with a consequent reduction in the tax rate and general satisfaction among taxpayers.

LAWS

The City Plan Commission of East Orange was created under Chapter 170 of the Laws of 1913 "to prepare a plan for the systematic and future development of said city." A supplementary city planning law, Chapter 218 of the Laws of 1921, defines more specifically the range of subjects that may be treated by a Plan Commission in a city of the second class, and provides that the governing body may consult it on any one of the matters listed.

Unfortunately, second class cities, (that is, New Jersey cities with between 12,000 and 150,000 inhabitants) cannot exercise some of the powers granted to first class cities by Chapter 72 of the Laws of 1913 nor to third class cities and all smaller municipalities by Chapter 188 of the Laws of 1915. These various laws permit other cities to require the approval by a City Plan Commission of all plats or replats before acceptance for record, and also their approval as to the location and architectural design of any public works of art. It is of the greatest importance that City Plan Commissions should introduce a bill to the State Legislature granting to second class cities powers similar to those enjoyed by all other municipalities throughout the state.

In a city the size of East Orange, it is of doubtful wisdom to combine the functions of passing upon questions of art with those involved in city planning. It is therefore thought desirable that a bill should be introduced in the legislature permitting first and second class cities to create municipal art commissions, such as exist in the states of Pennsylvania and New York.

Under Chapter 152, Laws of 1917, New Jersey municipalities have the right to

assess benefits upon lands in the neighborhood of an improvement. The Playground Act of 1911 and its supplement of 1921 and the Essex County Park Commission Act of 1915 with its amendment of 1921 do not permit the assessing of benefits locally. It would be most advantageous to the city to have these acts amended so as to permit of local assessment for benefits.

The building zone ordinance of East Orange was passed in conformity with Chapter 156 of the Laws of 1918 as supplemented by Chapter 240 of the Laws of 1920 and Chapter 82 of the Laws of 1921. These laws are similar to those in effect in many other states; but since New Jersey courts have manifested a tendency to confine their interpretation of the scope of a law to the strict letter of the limits of the title and of the text, it is exceedingly desirable to secure the enactment by the next legislature of an amendment which would cover more specifically various reasonable current needs. These are treated in the present laws only by implication. This amendment should include, for example, a more adequate definition of the powers of the Board of Appeals, a systematically prescribed procedure for the enforcement of zoning ordinances, direct authorization for the creation of setback building lines, authorization of one-family house districts where reasonable, and of interior light, ventilation and congestion restrictions.

If the above laws were enacted, the City of East Orange, with the continuing help of its City Plan Commission, would be in a position economically and in a reasonably short time to realize most of the desirable improvements recommended in this report.

REGIONAL PLANNING

It has proved an exceedingly difficult task in the preparation of the East Orange Plan to stop the investigations and studies at the arbitrary corporate limits of the City of East Orange. Economically and socially East Orange is inextricably bound up with the surrounding communities. They would all gain by cooperating in a unified study of their common problems.

Attempts were made in this direction by the creation of an informal interurban thoroughfare commission in 1916 at the instigation of the City of Newark. The enactment of Article 16 of Chapter 185 of the Laws of 1918 creating county planning commissions was another step in this direction.

The Essex County Park Commission and the Passaic Valley Sewer Commission have both proved by results the value of regional cooperation. The 1921 playground bill authorizing the creation of regional playground commissions is another step in this direction.

The individual municipalities obviously find themselves at a great disadvantage in negotiating separately with large public service corporations and with the railroads. On the other hand, each municipality very properly aims to preserve its own individuality. It does not want to have its development controlled by its neighbors. The method employed so successfully in the Boston and Cleveland metropolitan areas, of having the various local city plan commissions meet at intervals in joint conference for an open discussion of common problems, has much to

commend it. Thus only can a regional plan be worked out which will provide for an adequate system of thoroughfares, transportation facilities of various sorts, parks, playgrounds, zoning control and distribution of assessments.

THE COMPREHENSIVE COORDINATED PLAN

At all times throughout the study of each element of the East Orange City Plan, the relation of that element to the rest of the City Plan must be kept constantly in mind. The same piece of property may often be needed for a thoroughfare expropriation or for either park, playground, school, railroad or business use. A constant process of adjustment and of give and take has been found necessary, so that in every case of overlapping the final recommendation has been shaped toward making the most effective use of the property in question.

This has necessarily led to the preparation of the City Plan Map which accompanies this report. This map shows by various symbols and conventions virtually all of the recommendations made throughout this report, in so far as they can be shown effectively on any map. In many cases, the alternative recommendations made in the thoroughfare study and in the park and parkway study are both shown, with the hope and expectation that the latter would control. This map should become generally known as the "East Orange Plan" and should serve as a chart by which hereafter the city may steer. Modifications will have to be made in the future as conditions change, but this Plan will serve as a guide and record in connection with the consideration of modifications and should help promote continuity and harmony of development.

GETTING RESULTS

The East Orange City Plan Commission and the Commission on Building Districts and Restrictions believe that they have already shown the capacity for accomplishment. A complete zoning ordinance is in effect, grade crossings have been removed, the Main Street roadway is being widened, the recommended setback building line is being established, North Harrison and Harrison Streets are being widened, and the Fourth Avenue, Spring Street, McKinley Avenue and Rutledge Avenue extensions have been authorized.

A number of other recommendations, including various street extensions and widenings, and the civic center project, are now under active consideration by the governing authorities of the city.

These various achievements—in particular, zoning—have created an interest on the part of the public which should be now crystallized into an ardent popular demand for carrying into effect, step by step, the recommendations of this report, so that the complete City Plan may eventually be realized.

The Plan should be in every home, school room, church, club and place of assembly. It should become a living asset to the community. Children should grow up with it and know about it. It is the people's plan for their own city.

APPENDIX

THE DETAILS

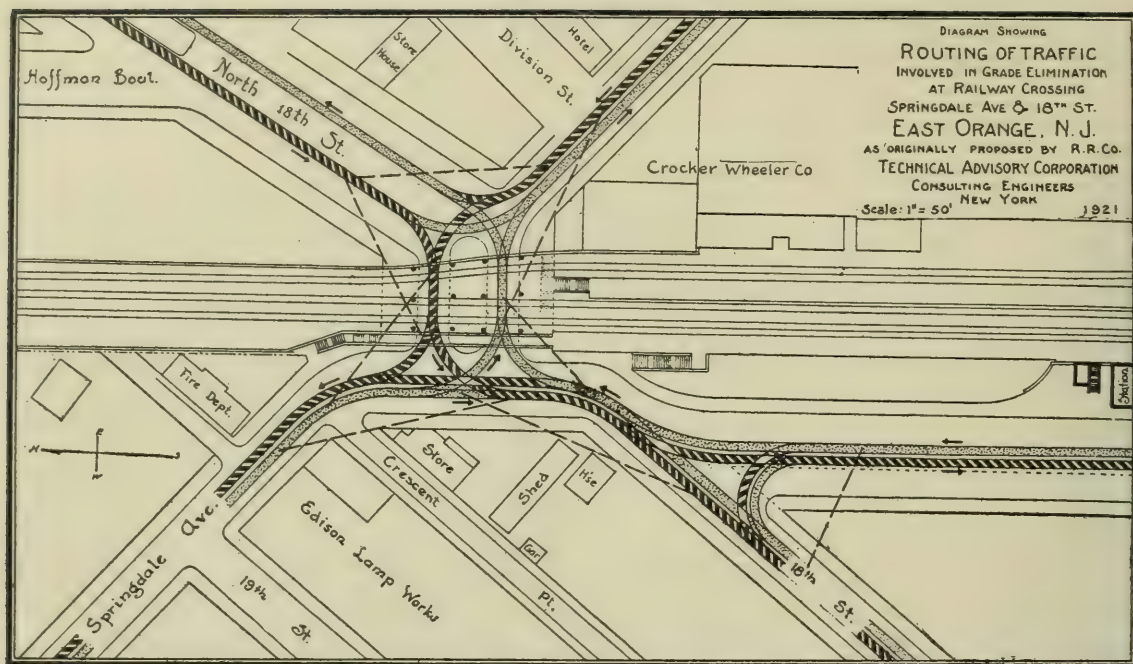


Fig. 1

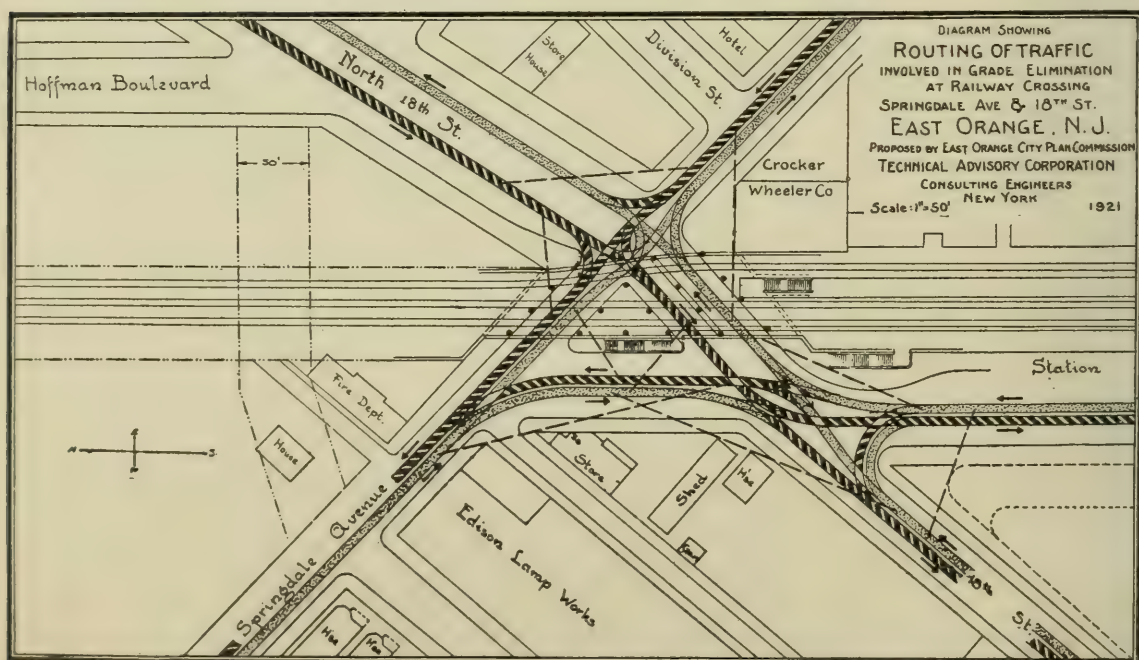


Fig. 2

I.

GRADE CROSSING ELIMINATION

LACKAWANNA

THE elimination of grade crossings along the Lackawanna Railroad through East Orange has been agitated for twenty-five years or more. Plans were made as early as 1906, but the city and the railroad could not agree as between elevation and depression. The matter was carried to the Public Utilities Commission and elevation was directed. Further progress was delayed by the war and the subject was not reopened until the middle of 1920. With the return of the railroads to their owners by the Federal Railroad Administration it became apparent that the time had come for elevation of the Lackawanna Railroad through East Orange. The City Plan Commission at once took cognizance of questions relating to the design and location of street crossings under the proposed elevated tracks. Preliminary studies were completed during the summer of 1920 and a report was submitted which covered the general subject and treated two or three specific under-crossings in some detail. It was recognized that track elevation would produce a traffic barrier even though practically all present crossing streets were carried through. This is due to the creation of approach grades to the under-crossings and the interference with vision caused by the track structure. There are also incidental interferences due to limited head room, occasional difficulties in drainage, increased lighting demands and minor paving difficulties.

The main line of the Lackawanna Railroad is approximately parallel with one of the major rectangular street directions of the city, hence these streets do not require modification. The Montclair branch cuts both street directions at an oblique angle and there the problem is more difficult since under-crossings are necessary in both directions. This is partially offset by the fact that the Montclair branch traverses a relatively undeveloped section.

The plans of the railroad, as originally approved by the City Council, provided along the main line, thirteen vehicular under-crossings and one additional crossing for pedestrians, in a length of 7,840 feet. All, excepting that of Main Street, were substantially right angle crossings and the average spacing between crossings was about 650 feet.

Along the Montclair branch, having a total length within the city limits of 6,100 feet, there were to be four crossings, two for the east-west street system, the Grove Street crossing for the north-south system and a combined intersection at Springdale Avenue and North Eighteenth Street. The average spacing of all proposed crossings was 1,220 feet.

The City Plan Commission called attention, at an early date, to the inadequacy of the crossings proposed along the Montclair branch. The outcome of this was the addition of an under-crossing on the Rutledge-Second Avenue extension. The Commission pointed out important objections to the combined under-crossing at Springdale Avenue and North Eighteenth Street as originally proposed by the railroad company. Springdale Avenue is a 50-foot thoroughfare. North Eighteenth Street is 100 feet wide north of the crossing point and 50 feet wide south of it. The original design (Fig. 1) contemplated a double opening underneath the track and at right angles therewith, with two roadways each 22 feet wide. This design was considered wrong in type and dimensions, especially with reference to possible future traffic developments, and conducive to accidents. A substitute design (Fig. 2) was submitted by the City Plan Commission in November, 1920. However, after conferences between the consulting engineers of the Commission and the chief engineer of the railroad, and much discussion (with, it is thought, over-emphasis on the excess cost of the substitute plan) the City Council finally accepted the railroad company's design, but with important modifications suggested by the City Plan Commission. With the plan suggested by the Commission, no turning of vehicles would be required in order to pass under the structure and continue along their routes. From the standpoints of angle of visibility when approaching the intersection, interweaving of traffic, need of police control, speed of traffic and other items, it is felt that the Commission's plan would have been vastly preferable.

ERIE

The Orange Branch of the N. Y. & G. L. R. R. traverses the northerly section of East Orange over a stretch of 5,900 feet in which there are nine grade crossings. Excepting at Midland Avenue the railroad elevation is such as not to influence the street approach grades. That particular thoroughfare crosses the railroad at the lowest point along the street. The profile of the railroad is quite irregular, as indicated by Fig. 3.

By establishing a uniform grade from the summit at Arlington Avenue, in Bloomfield, through to the West Orange boundary, all streets, except Midland Avenue, could be carried under the elevated railroad structure without serious changes of grade. That thoroughfare would require a depression of about 6 feet which would be serious in view of the present grades of the street as they approach the intersection from each direction. An over-crossing at Midland Avenue would also necessitate heavy grades or very high costs for lesser ones.

By establishing a profile starting from the summit at Arlington Avenue and running to a high point over Midland Avenue and then carrying the track practically level throughout the city and in Orange, the Midland Avenue condition could be made acceptable. This would require a railroad grade of 44/100 of one per cent between Arlington and Midland Avenues, which is much below other grades on the Orange Branch. A flattening would be desirable for a short distance in the vicinity of the Prospect Street station. It does not seem practicable to depress the tracks of the Erie because they follow closely the Second River, and, unless a substantial depression were possible, the over-crossings would have to have heavy grade street approaches.

There is already important traffic on Glenwood Avenue and North Park Street. Accidents will be sure to occur as the adjacent population and street traffic increases, but, aside from this consideration, track elevation on the Erie is by no means economically justifiable.

The Public Utilities Commission of the state, in connection with its system of establishing relative urgencies of grade crossing eliminations, has designated the Prospect Street crossing as of "A" grade because of the volume of traffic and curtailment of view. The other crossings of this railroad through East Orange are all designated as of "B" grade, which is equivalent to saying that they are not looked upon as subjects for early attention.

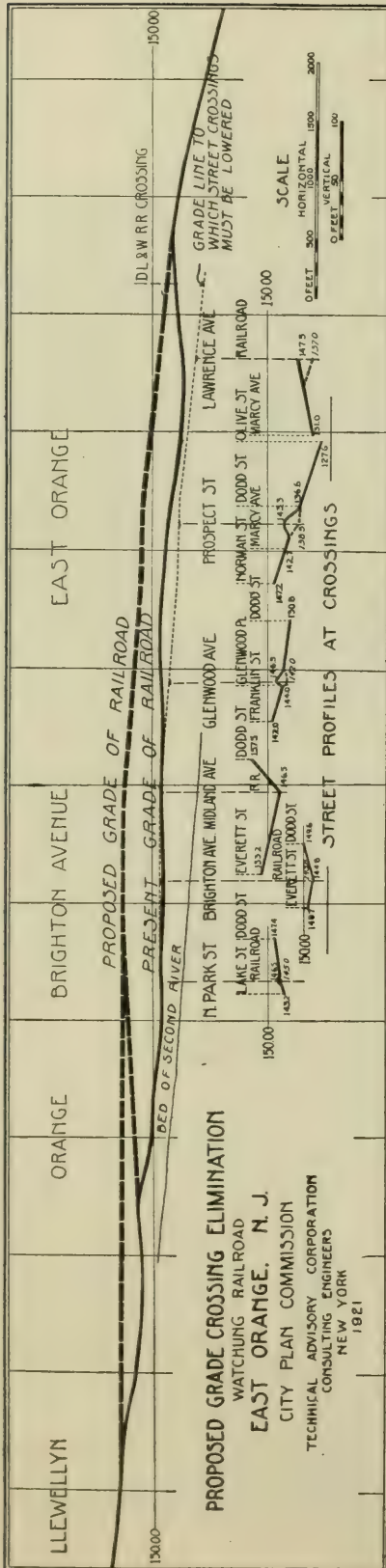


Fig. 3

The following is the record of traffic counts and train movements at two points, made under the direction of the consulting engineers:

	Location 1	Location 2
Duration of count, hours.	8½	8
Pedestrians.	1,355	264
Horse-drawn vehicles, iron tire.	154	90
Small auto trucks.	103	58
Large auto trucks.	51	9
Automobiles.	620	80
Horse-drawn vehicles, rubber tire.	12	1
Street cars.	...	...
Motor buses.	...	...
Other vehicles.	165	...
Total motor vehicles.	774	147
Total horse-drawn vehicles.	166	91
Total vehicles.	940	238
Eastbound passenger trains.		10
Eastbound freight trains.		3
Westbound passenger trains.		8
Westbound freight trains.		3
Total passenger.		18
Total freight.		6
Total.		24

- Location 1: Prospect Street between William and Carlton Streets
- 2: Glenwood Avenue between Eastwood Street and Park Avenue

Assuming an average delay for all traffic valued at 5 cents, and estimating the number of vehicles on the basis of the above table at 600,000 per year for all crossings, grade elimination would save the public \$30,000 annually. During a period of practically five years, four accidents resulting in injury to individuals at crossings occurred on the Orange Branch of the Erie Railroad, none of them in East Orange. If, however, it is assumed that one accident might occur per month under any possible condition of the near future and that the average compensation to be paid by the railroad is \$1,000, the saving to the railroad by the elimination of grade crossings could not exceed \$12,000 annually. In addition there would be a saving due to the elimination of watchmen's wages, gate maintenance and other items which are estimated roughly to make the total saving to the railroad about equal to that to the public. The corresponding total gain of \$60,000, capitalized, would amount to about \$1,000,000 which is far below the amount which would be required to eliminate grade crossings on the Erie through the city of East Orange. It is recognized, of course, that there are considerations which go beyond a strict economic analysis of this sort, but it is felt that these considerations cannot prevail in the near future. It seems almost certain that the subject will have to be deferred at least until 1940.

II.

THOROUGHFARE AND STREET SYSTEM

UNDERLYING PRINCIPLES

THE size, location and general topography of each community must be considered in studying its street system. East Orange is of such location and size that transportation is naturally largely of the through type and in the direction either of the meridian or at right angles to it. The problem therefore resolves itself largely into an analysis of the adequacy of north-south and east-west streets. With one possible exception, no diagonals or cut-offs seem to be needed. In a small community, the rectangular system is superior to any other. In general, the East Orange streets are of this kind.

Many sections have been platted and the streets constructed by private developers, each of whom has arranged his own plot without reference to through traffic needs or the general street system. The result has been the creation of many off-sets and dead end streets. A somewhat disconnected system is permissible and even advantageous in a small residential district. It serves to exclude random and through travel. However, no such district should exceed a quarter of a mile in maximum lateral dimension between main thoroughfares.

The methods of real estate development which have been followed have also resulted in areas in which streets are lacking and in which the streets run the wrong way. In general, streets which run north and south are best for residence purposes, because it is then possible to have each room secure some direct sunlight each sunny day. Furthermore, because East Orange is a large commuting community, and the railroads run in a generally east and west direction—with stations well distributed—the streets should largely lead north and south toward the stations.

The average vehicle using East Orange streets was found by measurement to be 67 inches wide and to occupy the same amount of street space whether parked near the curb or moving through the street. Two vehicles standing at the curbs, one on each side of the roadway, and an additional one moving in each direction in the intervening space, would occupy 22.3 feet. Many East Orange roadways are only 28 feet wide. The average clearance between passing vehicles on such a street would be only 23 inches. Even with a 30-foot roadway, the clearance is only 31 inches. Such narrow widths seriously hamper traffic movement by restricting speed. Even an increase of two feet in a 30-foot roadway permits a much greater proportionate increase in velocity.

With blocks longer than about 500 feet, a tendency exists for pedestrians to seek short cuts through the centers of such blocks. Again, when lots are deeper than about 150 feet, they tend eventually to the erection of rear dwellings which are apt to be of the tenement type and are otherwise objectionable. Therefore, blocks should almost never be larger than 300 by 600 feet.

GENERAL ANALYSIS OF THE MAJOR THOROUGHFARE PROBLEM

With the above-outlined general principles in mind, the street system of East Orange was examined to determine the possibility of planning a thoroughfare system which would make the best possible use of existing facilities, create through thoroughfares connecting with those in adjoining communities, and provide a complete system for local traffic of all kinds.

Figure 4 shows those streets now having roadways 30 feet or more in width which might form a part of the major plan. They form an approach to a grid, but there are too many disconnected sections. Figure 5 shows the more important existing streets having narrow roadways which can be widened to 30 feet or more, with or without a physical widening of the street itself. Figure 6 shows the street system as it would appear if all existing major streets had satisfactory roadways. The system is still incomplete. Figure 7 shows necessary extensions to give East Orange a complete major street plan. The aggregate of new streets is only 3.43 miles. Figure 8 shows the complete plan.

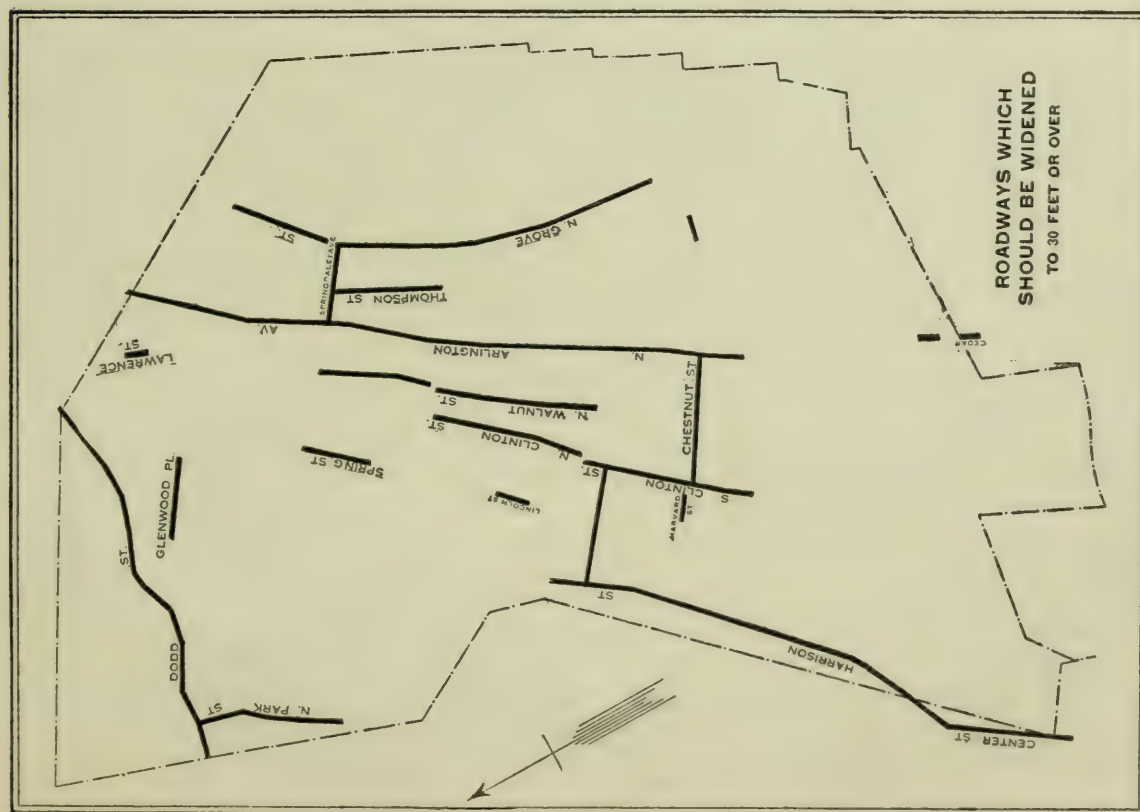




Fig. 6

As determining factors in establishing this plan, it is necessary to consider the street system of the city of Newark, and the fact that both branches of the Lackawanna Railroad rise from a cut to an elevated structure as the tracks enter East Orange. As a result of these facts, it is practically impossible to secure a through north-south street on the east side of East Orange until Eighteenth or Nineteenth Street is reached. The development of a through thoroughfare here involves the correction of disconnections near the railroad; an additional crossing under the railroad; the purchase of small pieces of property near Main Street and roadway widenings. The next possible thoroughfare, westerly, is Grove Street. Its roadway must eventually be widened. After Grove Street, the Parkway, including Thompson Street and Roosevelt Avenue, should be a main thoroughfare. The necessary property acquisitions should be made without delay, so as to eliminate or reduce offsets and provide connection with the street systems of Bloomfield and Newark, where the thoroughfares which would naturally connect are of a desirable type. Whittlesey and Birchwood avenues should then become a part of the parkway system. Next in order is Arlington Avenue, for the improvement of which, diversions and extensions are necessary through Freeman Avenue. Clinton Street should be widened and also improved where it crosses Main Street, and be extended northerly. Halsted Street should be extended through the block between Main and William streets, in spite of the high value of existing property, and eventually connected either to Prospect or to Spring Street. Sanford Street should be connected with Harrison by a new street carried across Central Avenue about midway between them. Harrison Street, in combination with Center Street in Orange, must be treated independently because of the wide spread between these two thoroughfares toward the south.

There are very large areas in the northern part of the city, such as those between Dodd Street and Glenwood Place, which will eventually require a number of secondary thoroughfares; but these have not been shown on the map of Fig. 8 which indicates major thoroughfares only.



Fig. 7

Turning now to a consideration of east-west thoroughfares, South Orange Avenue, forming a part of the southern boundary, is of little interest. Tremont Avenue should be opened between Grand and Shepard avenues, and jogs at Sanford Street removed. Rhode Island Avenue with Park End Place constitutes the next cross street to the north, and some rectification is necessary at the Sanford Street corner. Elmwood Avenue should be extended easterly to intersect the southern extension of the Parkway.

There is real need of a connection between Clifford Street and Linden Avenue, but such a connection, while at one time laid out, would now be prohibitively expensive. The series consisting of Sussex Avenue, Maple Terrace, Chestnut Street, Harvard Street and Berwyn Street should be made continuous and this can be in great part accomplished without taking buildings. This will be a highly beneficial improvement because of the long blocks between Central Avenue and Main Street. A similar consideration would justify the creation of a continuous thoroughfare through Fourth Avenue, Hamilton Street, Eastwood Street and Burchard Avenue. The extension of Fourth Avenue as recommended by the City Plan Commission has been approved by the Council. There are serious difficulties here, but these may be avoided without very great displacement of the continuity of the street. Another system of disconnected streets exists just north of Springdale Avenue, comprising Second Avenue, Rutledge Avenue, Edgerton Terrace, Edgewood Road and Everett Street. Again in conformity with the recommendations of the Commission, Rutledge Avenue has been extended. Another potential thoroughfare will be formed by linking up First Avenue, Hoffman Boulevard, Renshaw Avenue, Glenwood Place and Dodd Street.

A detailed description of the several major street improvements needed to complete the street system would be too long for inclusion in this report. All the suggested changes, extensions, widenings and other improvements are shown on the comprehensive plan and are listed approximately in their

rescinded, and the recommendation of the Commission adopted in a subsequent ordinance under which the roadway is being reconstructed to a width of 52 feet from the crossing of the Lackawanna Railroad westerly to the Orange line. The same widening should be extended easterly to the Newark line.

The diversion of some of the traffic now using Main Street would further greatly relieve the situation. Such a diversion is now going on automatically on a small scale through Sussex Avenue and through Hedden Place. The continuation of Sussex Avenue westerly, practically to the city line, is entirely feasible. It is now too late to consider a railway viaduct supported on steel columns so designed as to permit of a street under the railway tracks, but it is possible to build a new street connecting Grove Street and Davis Avenue in a cut adjacent to the railway tracks with an extension of the pedestrian bridge over the cut at Maple Avenue. Land is available on the north side of the railway for further extensions of this street so as to carry it from the eastern boundary of the city to the point where the railroad crosses Main Street. From that point westerly the proposed new street should be south of the railroad.

Another type of street extension which should have consideration is exemplified by the new and improved approach to the Ampere station of the Lackawanna from the intersection of Fourth Avenue and Eighteenth Street. This should be made the basis of detailed real estate studies. It is believed that the augmentation of values might completely offset the cost of the improvement.

EXAMPLES OF METHOD EMPLOYED

In connection with the detailed investigation which was given several of the more important suggestions for street extensions and widenings studies were made of all pertinent factors.

A suggestion was received for opening a new street located about midway between Main Street and the new and extended Railroad Place, from Harrison Street to Halsted Street. When this suggestion was made, it was thought likely to be financially justifiable as well as directly beneficial from a traffic standpoint. It was decided to test the soundness of this belief. To do this, appraisals were made of every piece of property involved.* The enhancements of value due to the construction of the new street were carefully estimated. The cost of physical construction, including demolitions, was also determined.

An allowance was made for compensation to owners of property to be taken over. The total expenditure was thus estimated at \$239,876. Against this amount, is to be offset the present worth of taxes to be derived indefinitely from the increase of the values produced. The increased land value was estimated at \$51,379. The aggregate values of improvements on a front foot basis, added to this, gave a total enhanced value of \$184,000. The corresponding annual tax income would be \$4,610. The present worth of this sum, paid annually for 100 years, taking interest at 4 per cent, is \$115,250, which is scarcely half the estimated cost of the project. It is therefore concluded that the proposed new street is not financially justifiable purely from a real estate point of view. Other factors must, however, be taken into consideration.

Another quantitative method of study was applied to the same problem. The Brick Church station is the second largest commuting point on the Lackawanna Railroad, and a large number of commuters use automobiles. There were 122 arrivals and departures of automobiles in one hour on a November evening of 1921. Improvement of street facilities is of grave importance. If the commuter's time is valued at even only one cent per minute, and the average loss of time is only two and one-half minutes each morning and evening, then the loss is \$0.05 per day per car, or for 1,000 cars, the cost to the inhabitants of East Orange due to congested street conditions at this point would reach an annual total of \$15,000. Capitalized at 5 per cent, improved street conditions at the point in question would be worth \$300,000, very roughly speaking. On a basis of any such figures as these, the city would be amply justified in bonding itself to cover all costs which could not be assessed locally.

*As an interesting incident to this work, a preliminary study of tax values was made by computing front foot values for lots 100 feet deep using the well-known Newark rule. The plotted results showed surprising consistency as compared with similar diagrams prepared in many other cities. They also disclosed a consistent method of computing increases for corner influence. In addition to these gratifying disclosures, it was also discovered that several tracts were apparently not assessed on the tax books.

Somewhat similar methods were used in connection with a study of the proposal to extend Halsted Street from Main Street to the end of Spring Street just south of Hamilton Street. The total cost was estimated to be \$92,355; the total eventual increase in real estate values, \$298,265, of which \$58,265 would be immediate, on the land abutting the proposed street. The proportion which might be locally assessed was thus between \$50,000 and \$60,000, while the eventual values would return ample taxes to meet interest and sinking fund on bonds sufficient to cover the balance of the cost, to say nothing of benefits from traffic betterments. Another street opening problem studied was the proposed extension of Sussex Avenue parallel with Main Street from South Grove Street to the intersection of Chestnut Street with South Arlington Avenue. The cost of the improvement was estimated at \$90,015, and the resulting increase in real estate values \$111,200. In this case an actual (though small) profit is disclosed and in addition the gain from a traffic standpoint would be very great. The project is therefore one for consideration at an early date.

In all of these cases of street improvement it has been realized that projects involving the taking of private property are the least attractive and that those necessitating the destruction of trees are also highly objectionable. The purchase of unimproved property may be contemplated with more equanimity, but even this expenditure is to be avoided in the correction of jogs and the widening of streets where more economical policies can be made adequate. The occasional omission of one sidewalk, the prohibition of parking, the setting back of curbs, the use of curb pockets for parking, and other devices have been considered in connection with every proposed street revision, and similar treatment of adjacent, parallel relieving thoroughfares has been considered wherever costly improvements in the way of widenings and extensions have been suggested.

STREET EXTENSIONS AND WIDENING RECOMMENDED FOR CONSIDERATION AT STATED INTERVALS FROM 1922 TO 1972 AND BEYOND

IMPROVEMENTS WITHIN FIVE YEARS

Ampere station approach
Sussex Avenue extension, including widening of Maple Terrace
Halsted Street and Spring Street extension, including widening of Lincoln Street
Eaton Place extension to East Orange Parkway and to North Fifteenth Street
Eastwood Street extension to Burchard Avenue

IMPROVEMENTS WITHIN PERIOD FROM TEN TO FIFTEEN YEARS

North Nineteenth Street extension to North Eighteenth Street
Arlington Place widening from Arlington Avenue to East Orange Parkway
North Park Street roadway and street widening
Chestnut Street and South Clinton Street east corner cut-off
Chestnut Street extension to Harrison Street
Springdale Avenue roadway widening from the Newark line to Arlington Avenue
William Street roadway widening from Fourteenth Street to Prospect Street
Shepard Avenue extension to South Walnut Street

IMPROVEMENTS WITHIN PERIOD FROM FIFTEEN TO TWENTY YEARS

Arlington Avenue and Rutledge Avenue east corner cut-off
North Clinton Street and Rutledge Avenue north and south corner cut-off
Prospect Street roadway widening from Main Street to Dodd Street
South Clinton Street and Main Street intersection corner east cut-off
North Nineteenth Street and Main Street intersection corner cut-off
East Orange Parkway extension to the Newark line
Arlington Avenue extension to Elmwood Ave.
Grove Street roadway widening
Glenwood Place roadway widening
Roosevelt Avenue extension to corner of Arlington Avenue and Renshaw Avenue
South Munn Avenue widening from Central Avenue to Main Street
Springdale Avenue roadway widening from the Newark line to Arlington Avenue
St. Agnes Lane extension to Arlington Avenue
Lawrence Street roadway widening from Norman Street to Marcy Avenue

IMPROVEMENTS WITHIN PERIOD FROM
TWENTY TO TWENTY-FIVE YEARS

Prospect Street and Renshaw Avenue intersection cut-off, north and south corner
Renshaw Avenue street widening between Arlington Avenue and railroad line
Sawyer Avenue extension under railroad tracks to meet Renshaw Avenue
Second Avenue extension under railroad tracks to meet Rutledge Avenue
North Park Street and Springdale Avenue intersection, south corner cut-off
Hamilton Street extension to Woodland Street
Brick Church station, street line changes—except Railroad Place extensions
Harrison Street street and roadway widening—except from Railroad to Main Street
Park End Place and Sanford Street intersection west corner cut-off
Halsted Street extension to the Newark line
Norwood Avenue extension to Mountain View Avenue

IMPROVEMENTS WITHIN PERIOD FROM
TWENTY-FIVE TO THIRTY YEARS

Dodd Street street and roadway widening
North Clinton extension to Norman Street and Walnut Street intersection
Belgrade Avenue extension and connecting extensions of North Twenty-second Street and North Twenty-third Street
Springdale Avenue street widening from the Newark line to Arlington Avenue
North Walnut Street roadway widening from Main Street to Springdale Avenue
Tremont Avenue and Sanford intersection cut-off west corner
South Clinton Street roadway widening from Central Avenue to the railroad line
North Nineteenth Street street and roadway widening from Park Avenue to Springdale Avenue
South Clinton Street street widening from Central Avenue to the railroad line
Tremont Avenue extension from Shepard Avenue to Grand Avenue
Park End Place roadway widening
South Walnut Street roadway widening from Lenox Avenue to Main Street

Thompson Street roadway widening
South Walnut Street street widening from Lenox Avenue to Main Street
Fair Street extension to Midland Avenue
Thompson Street street widening

IMPROVEMENTS WITHIN PERIOD FROM
THIRTY TO THIRTY-FIVE YEARS

Park Street and Schuyler Terrace connecting street
Connecting from Harrison to Sanford Street in northwesterly direction from Sandford Street intersection with Clifford Street

IMPROVEMENTS WITHIN PERIOD FROM
THIRTY-FIVE TO FORTY YEARS

Ely Place extension from North Clinton Street to Arlington Avenue
Lincoln Street extension in northwesterly direction to Prospect Street

IMPROVEMENTS WITHIN PERIOD FROM
FORTY TO FIFTY YEARS

Ely Place extension to Prospect Street and Franklin Street intersection
Elmwood Avenue extension to Whittlesey Ave.

IMPROVEMENTS BEYOND FIFTY YEARS

Spring Street extension to Renshaw Avenue
William Street and Grove Place connection
Vernon Terrace and North Twenty-second Street connection
Eaton Place and North Nineteenth Street south corner cut-off
Arlington Place and Winans Street east corner cut-off
Lindsley Street extension to Ross Street
Hudson Avenue extension to the Newark line
Freeman Avenue extension to the Newark line
North Street extension to Main Street

IMPROVEMENTS PROBABLY UNDERTAKEN BY PRIVATE ENTERPRISE

Relieving street between Brighton Avenue and Midland Avenue from Dodd Street to the Glenridge line

Fulton Street and Dodd Street connecting street

Woodland Avenue extension to Fernwood Rd.

Springdale Avenue and Woodland Avenue connection parallel to the latter

Morris Street extension from Springdale Avenue to Renshaw Avenue

Winans Street extension from William Street to Park Avenue

Girard Avenue extension from Fair Street to the Glenridge line

Brighton Avenue extension from Fair Street to the Glenridge line

Park Avenue, Summit Street, and North Clinton Street, block opening street

Block opening street from McKinley Avenue to Lenox Avenue

New street from Tremont Avenue to the Newark line westerly from Ross Street

Ross Street extension to the South Orange line

Sunnyside Terrace extension to Rhode Island Avenue

Oak Street extension to Hudson Avenue extension

Parallel street between Munn Avenue and Freeman Avenue from Rhode Island Avenue to the Newark line

Watson Avenue extension to meet Jones Street

Whittlesey Avenue extension to the Newark line

III.

STREET DETAILS

FIELD SURVEY

THE execution of a comprehensive city plan with reference to thoroughfares logically includes along with the economic studies, collateral inquiries, looking specifically toward improvement in the general appearance of the community. With this end in mind, a survey was made of street conditions throughout the city. This investigation included observations as to the size, spacing, condition and variety of street trees; the appearance of catch-basins, curbs, gutters, roadways and private drives; the presence and appearance of poles and wires; and finally, led to a general coding and tabulation of the composite appearance of each street, block by block. The complete tabulation of data is too extensive for incorporation in this report, but one sample page is appended (Fig. 9). It is recommended that the complete tabulation and code be kept on file in an appropriate municipal office, and made available for public reference.

The general characterization of each block (contained in the last column of the tabulation) make it possible for individuals, in different parts of the city, to compare blocks in which they are interested with other blocks. Local associations can also use the information to compare their districts with others, and it may thus be possible to engender competition in securing improved appearance in parts of the city.

From year to year, similar surveys would disclose any improvement in condition, so that the progress made could be roughly estimated.

ROADWAY SURFACING

Generally speaking, and with few exceptions, the streets of East Orange are paved. Only a few streets have pavements of the type generally designated as "permanent." A large majority are either macadam or telford. During the past few years, many of the latter have been resurfaced with an asphaltic or tar-bound finish. These asphalt-bound pavements are generally found adequate for suburban districts. The modern tendency in highway engineering is, nevertheless, toward the installation of asphaltic surfaces on concrete foundations.

East Orange has a large street mileage which should be thus treated. Whereas a five-inch concrete base is normally adequate for residential and suburban traffic, heavy traffic thoroughfares require thicker foundations, especially where the traffic is carried preponderatingly by motor truck. For this heavier traffic, a better wearing surface should be provided than is afforded by the usual asphaltic type. For the heaviest traffic, granite block pavement should be employed, consisting of carefully cut blocks with close joints, installed with a jointing material consisting partly of asphalt and partly of tar, mixed with as much hot, fine sand as can be carried. On flat grades, carefully laid creosoted wood block pavement is satisfactory. Only very flat crowns should be employed. Wood blocks should not be used on grades of over one and one-half per cent. and arrangement must be made to keep wood block pavements which approach this limit well sanded in slippery weather.

Sheet-asphalt pavements are satisfactory where the traffic is dense but does not consist of many individually heavy vehicles. As far as possible, residential and suburban pavements should be constructed in accordance with a specification which will provide the so-called Topeka type of pavement. This is very close in character to some of the patented pavements which are generally considered the best which the art of today affords.

Generally speaking, as much large stone should be used in the surface as can be satisfactorily manipulated. The inclusion of this material provides as good a grip for automobile tires as anything that has been discovered thus far.

The work being done by the City Engineer's office in street pavement construction and reconstruction has been found entirely satisfactory wherever investigation has been made. It is suggested that the City Engineer be called upon by the municipal authorities to prepare a comprehensive paving program on the basis of an agreed definite annual expenditure for pavement reconstruction and improvement. With rare exceptions, the street grades in the city are easy and properly designed. A few need attention in connection with any future repaving work. A few others cannot well be improved without excessive cost. These are matters for study by the City Engineer at the appropriate time.

SIDEWALKS

On only a few blocks are the sidewalks made of the same materials or of uniform width, on both sides of the roadway throughout the full length of block. Concrete and flag of varying width are indiscriminately mixed. Widths vary from four to eight feet on residential blocks, and from four to nine feet on main business thoroughfares. Since blue-stone flagging is quarried not far from East Orange, the cost of sidewalks of that material is generally less than the cost for properly designed and laid concrete walks of the same width. The flag sidewalk is generally rougher, and does not present anything like as good an appearance as does a well built concrete walk. If properly laid, the life of the latter is fully as long as is that of blue-stone.

A persistent effort should be made toward securing the early construction of sidewalks on all streets. These should be uniform in width, alignment and material. While this sidewalk reconstruction program need not necessarily be carried out in conjunction with the repaving schedule, it is often advantageous to combine the two. It is recommended that the City Engineer's office be directed by the municipal authorities to prepare a comprehensive sidewalk reconstruction program, to be carried out over a series of years.

TREES

Variety—The variety of trees used in East Orange for street planting is unusually great. The city would look better if the planting of the less desirable kinds were discontinued. The planting of maples and oaks should be encouraged. Next in order and desirability are ginkgo and sycamore. Elms, horse chestnuts, lindens, Lombardy poplars and catalpas should not be used, except under conditions especially favorable to them. It is the practice on many of the streets to use different kinds of trees in the same block. In nearly all cases this has given the street a ragged appearance which should hereafter be avoided.

Spacing—The existing spacing of trees along nearly all the streets is too close for their proper development. They grow upright and “spindly,” and the lower branches die. Conditions in this respect can be remedied only gradually. Good results may be obtained by cutting out the poorest trees, thereby allowing the better ones to grow more naturally. Even in new planting, the trees are still being planted too closely. Three trees to the hundred feet, is the minimum spacing desirable. A distance of forty feet between trees is better. Close planting produces so much shade along the streets, that it is impossible to grow any satisfactory kind of turf in the parking strip. They should be staggered on opposite sides of the street.

Parking Strips—The parking strips for trees should not be too narrow. Many trees develop trunks thirty-six inches and more in diameter, and the surface root systems spread out to at least double this distance. For proper ultimate growth, a width of six feet is not too much for the parking strip. Lesser widths force the sidewalks and curbs out of place. Trees will die if girdled on all sides by sidewalks or curbs. When planting a tree, a hole should be dug four feet square and four feet deep. This should be completely filled with good soil and the roots well spread out. With occasional cultivation, mulching and watering, the young tree will then get a proper start in life.

GUTTERS

Most of the streets have block stone gutters which, as a rule, are unsightly. They also prevent a rapid run-off of water. The volume of water in East Orange street gutters is large, on account of the great distance between drains. Leaves and other particles frequently clog and back up the water. This would be mitigated with a smooth surfaced gutter. There is very little necessity for the use of block stone, as the street grades are quite flat.

Brick gutters, or combined cement curbs and gutters, would look better and give a quicker run-off.

CURBS

The sectional granite or flag-stone curbs so commonly used in East Orange are in many places falling over and getting out of alignment. This condition is most noticeable where the parking strips are narrow. A section taken through these granite curbs indicates that the depth is insufficient. This is one of the reasons for their poor condition. The curbs are also noticeably high out of the ground. This is desirable only where the roadway grades are flat and the run-off is slow. It would be better in most cases to use a concrete curb with six-inch top, ten-inch base and eighteen-inch depth, or a concrete combined curb and gutter.

STREET LIGHTING IN EAST ORANGE AND OTHER CITIES

An examination made in June, 1920, showed that the streets of East Orange were lighted by gas lamps aggregating 93,509 candle power. The report in question recommends electric lighting to be gradually installed until the following units shall exist:

Number	Candle Power
2,030	250
25	400
24	600
101	1,000
Total	2,180 units aggregating 632,900

The actual candle power of the gas units used was measured in 1918. The average was 43.5 candle power for Welsbach lamps and from 8 candle power down practically to zero for the open flame lamps. The present total, based on 1918 measurements, amounts to the figure given above.

In the following table, six cities are compared with East Orange. They are arranged in increasing order of population:

City	Population 1920	Miles of Improved Streets	Per Capita Cost of Street Lighting	Candle Power (1918)	Candle Power Per Capita (1918)	Candle Power Per Mile of Street
New Rochelle...	35,000	112	\$1.80	126,790	3.76	1,130
Mount Vernon..	44,250	85	1.20	143,000	3.44	1,680
East Orange (present).....	50,710	72	1.09	93,509	1.95	1,300
East Orange (proposed)...	90,000	80	....	632,900	7.03	7,900
Schenectady....	88,723	96	.90	774,650	9.10	8,069
Yonkers.....	100,176	130	1.74	579,560	6.00	4,458
Rochester.....	295,750	280	.89	.....	....	....
Buffalo.....	505,000	461	.99	5,832,120	12.00	12,651

While the adequacy of lighting cannot be judged from these ratios alone, it is apparent that East Orange stands at the bottom of the list as to per capita candle power, with less than two. With increase in population up to Buffalo, which has ten times the population of East Orange, the per capita consumption of street light has increased fairly steadily and logically to 12 candle power.

If the cities are listed in increasing order of *candle power consumed per capita*, as shown below, and compared with their order as to population, only two cities of the seven are out of sequence:

New Rochelle.....	3.76	Schenectady.....	9.10
Mount Vernon.....	3.44	Yonkers.....	6.00
East Orange (present).....	1.95	Buffalo.....	12.00
East Orange (proposed).....	7.03		

Yonkers has been passed by Schenectady, and East Orange is behind Mount Vernon and New Rochelle. The position of East Orange is less justifiable than is that of Yonkers, since East Orange is more nearly comparable with Mount Vernon and New Rochelle in general type than is Yonkers with Schenectady. The immediate adoption of the recommended program for lighting would advance East Orange above Mount Vernon, New Rochelle and Yonkers; but the actual consummation of such program might take twenty years.

Schenectady uses 50 per cent more light per capita than Yonkers, although her population is nearly 10 per cent smaller. This is due to the isolation and greater independence of growth of the up-state city, and in part to its importance as an electrical center, as well as to the low cost for its electricity.

A number of excellent reasons account for the increase of light in city streets at a rate much greater than that of increase in population. Light increases the use of the street, whatever that use may be; and when light increases, traffic, business and general conditions improve. Property valuations are often favorably affected. A reduction in automobile accidents is to be expected. Bright lights are more effective than watchmen in reducing burglaries, and are an aid to the police in the suppression of crime generally. A good lighting system and good morals go hand in hand.

The per capita cost of street lighting varies somewhat irregularly. New Rochelle with \$1.80 and Yonkers with \$1.74 seem to be disproportionately high. This is due to differences in cost of electric current, and also to excessive street mileage in proportion to population. Otherwise, the per capita cost tends to decrease as population and light consumption increase.

A comparison of total candle power per mile of street affords a more correct measure of the relative magnitudes of the several systems. East Orange occupies next to the lowest place in this respect, and would be at the bottom of the list if it were not for her restricted boundaries and for New

Rochelle's abnormally large mileage of improved thoroughfares. With this difference eliminated, the order of cities would be almost identical with that which they assume with respect to candle power per capita.

The comparisons thus far made have considered each city as a whole. It is more scientific to study the relative actual intensities of lighting provided at the center line of the street in specific modern installations. The following table shows the types of modern ornamental equipment for each lighting system:

City	Principal Lighting Unit	Spacing and Height	Foot Candles at Center Line of Street
New Rochelle.....	4-60 C. P. tungsten incandescent ball globe	50' opposite 18' high	0.177
Mount Vernon.....	4-100 W-80 C.P. tungsten incandescent ball globe	100' opposite 18' high	0.175
East Orange (proposed)	1-250 C.P. Mazda gas-filled double refractor	150' staggered 13' high	0.375 0.100 (average)
Schenectady.....	6.6 Amp. inverted luminous arc	100' staggered 14' high	0.41 0.30 (average)
Yonkers.....	4-40 W tungsten 1-100 W tungsten	125' staggered 11½' high	0.05
Rochester.....	6.6 Amp. inverted magnetite lamp clear globe	200' staggered 18' high	0.576
Buffalo.....	Inverted magnetite 6.6 Amp. diffusing globe	100' staggered	0.41
Stamford, Conn.....	.....	.....	0.35 (average)

The last column shows (except where noted) the calculated intensities of illumination opposite the lamp. In several instances, there have been added the reported or estimated average intensities of illumination along the center line of the street between lamps. The modern lighting unit directs the larger part of the light within an angle beginning approximately ten degress below the horizontal. This brings the light where it is most needed and favors a high average intensity between units. The gas lamp is particularly deficient in this respect.

New Rochelle and Mount Vernon use the ball globe cluster type of ornamental illumination, which does not represent the best practice today, and is being superseded because too much light is directed upward and lost. The figures of 0.175 and 0.177 foot candles for these cities are favorable in comparison with that in Yonkers, but the average lighting intensity between units is low. Single modern units of the same candle power would greatly increase the amount of useful light.

The following table gives an indication of the illumination intensities considered desirable for various classes of service, but local conditions may necessitate a variation from these values, and a further development of the lighting art may see them materially increased, as is evidenced by some recent western installations:

	Average Horizontal Illumination Foot-Candles
Principal streets in cities.....	0.25 to 1.0
Important side streets.....	0.10 to 0.25
Residence streets.....	0.01 to 0.05
Suburban roads.....	0.005 to 0.01

KEY TO SYMBOLS SHOWN ON SAMPLE SHEET IN REPORT OF SURVEY OF STREET CONDITIONS

	STREET TREES	ROAD	AP.		STREET TREES	ROAD	OVERHEAD
a	Beech	Asphalt	Appear- ance	PO	Space Diameter of trunks in inches, three feet above ground Spacing Sycamore	Parking Road Sidewalks	Poles
b		Brick		PK			
ab		Asphalt block		R			
AP				S			
C	Catalpa close	Curbs		s		Stream	Telephone Telegraph or Electric Trolley
CB		Catchbasins		SI			
CO		Cobble		SP			
co		Culvert		st			
ch	Chestnut	Drives		sy		Good or fair drains Good sidewalks on part of frontage and none at all on remainder	
cu		Dirt		tel			
D		Dirt sidewalk along part of frontage and none at all on remainder		tr			
-d				v			
e	Elm	Gutters Grass	Fair	-v	Variety Weeds	Wood block	Wires None Number of wires
f	Fair						
G	Good			VA			
g	Some trees good			w			
gp	others poor	Macadam	Good	wb	None Diameter of trees in inches	None Width of Parking strips in feet, number of driveways	
hc	Horse Chestnut			WI			
l	Linden			--			
lp	Lombardy Poplar			4			
m	Maple	Poor, used in com- bination Sidewalks or curb in poor condition along part of frontage and none at all on remain- der	Poor	(3)	Number of trees where only a few exist Diameter of trees varies from 4" to 24"		
mh	Gingho			4 24			
mixed	Several varieties						
o	Oak						
p	Poplar, poor						
-p							

Street Names	Between Streets	Distance	Street Trees				Road							Overhead		Ap.
			VA.	SI.	SP.	CO.	PK.	D	R	G	C	S	CB	PO.	WI	
Carleton St...	N. Clinton St. & Ashland Ave.	400	m p	8 30	g c	g	3dg	1	..	co	..	..	v	..	..	..
		400	m	6 24	c	g f	4dg	1	..	co	..	..	v	..	..	..
		370	m p	5 30	g c	g	3 1/2 dg	1	..	co	..	..	..	..	..	..
		790	m	6 24	g c	g	4 1/2 dg	1	..	co	..	..	..	..	..	..
Carnegie Ave..	Ashland Ave. & Lincoln St....	370	m	8 24	g	g	4 1/2 dg	2	..	co	..	..	v	..	..	..
		300	m	10 30	g c	g f	2 1/2 d	1	m	co	v	v	v	..	..	f
		800	m	4 30	g c	g p	2 1/2 d	4	m	co	v	v	v	..	..	f
		440	m	4 8	g c	g f	2 1/2 g	1	m	co	v	v	v	..	..	f
Carroll St.....	Nassau Pl. & Shepard Ave....	630	m	2 24	g	g p	2 1/2 g	6	m	co	v	v	..	..	..	f
		630	m	2 24	g	g p	2 1/2 g	2	m	co	v	v	..	..	..	f
	Shepard Ave. & Burnet St. ..															
Central Ave...	N. Park St. & Orange Line ..	270	1	3	g	g p	4 1/2 gw	..	..	co	..	..	cu	..	..	f
		265	m	2 10	g c	g f	3g	..	..	co	..	..	cu	..	..	f
	Newark Line & S. 18th St....	330	e	3 14	g c	f p	7dg	..	a	b	v	v	v	tr	..	f
		360	m	3 14	g c	f p	6dw	..	a	b	v	v	v	tr	..	f
Central Ave...	S. 18th St. & Hollywood Ave...	200	m e	4 24	g	f	7dw	..	a	b	v	v	..	tr	..	..
		200	e	4 36	c	f p	7dw	..	a	b	v	v	..	tr	..	..
	S. 20th & S. Grove Sts.	100	e	4 30	g	g f	7d	1	a	b	v	v	..	tr	..	f
		230	e	4 24	g	f	8dw	..	a	b	v	v	..	tr	..	f
	Steuben St. & Hollywood Ave..	320	e	18 36	g c	f p	8dg	..	a	b	v	v	..	tr	..	f
	Hollywood Ave. & S. Grove St..	500	m	12	c s	p	6g	1	a	b	v	v	..	tr	..	f
		500	e	4	g	g p	-7gw	2	a	b	v	v	..	tr	1	f
	S. Grove St. & S. Maple Ave..	550	m	12 20	s g c	f p	6gd	..	a	b	v	v	..	tr	..	f
		550	e	3 18	s g c	f p	7gd	2	a	b	v	v	..	tr	1	f
	S. Maple Ave. & Hawthorne Pl.	385	m e	14 24	g c	f	6 7d	2	a	b	v	v	v	tr	..	f
		410	m e	12 36	g c	f p	7d	..	a	b	v	v	v	tr	..	f
	Hawthorne Ave. & S.E.O. Pkwy.	200	m e	20 10	g s	f p	7d	1	a	b	v	v	v	tr	..	f
		200	e	10 20	g	f p	7d	..	a	b	v	v	v	tr	..	f
	Hawthorne Pl. & Birchw'd Ave.	190	m	4 16	g c	f p	-7dgp	..	a	b	v	v	v	tr	..	f
		600	m	4 12	g	f p	7d	1	a	b	v	v	v	tr	..	f
	Birchwood & Whittlesey Ave...	250	m	4 4	g	g p	8g	..	a	b	v	v	v	tr	..	f
		240	e	2 24	c s	g p	7dg	1	a	b	v	v	v	tr	..	f
	Whittlesey & Watson Aves....	520	m e	4 10	g	f p	8d	..	a	b	v	v	v	tr	..	f
		400	m e	16 36	g c	g p	7dg	..	a	b	v	v	v	tr	..	p g

KEY: VA—Variety. SI—Size. SP—Spacing. CO—Condition. PK—Parking. D—Drives. R—Roads.
G—Gutters. C—Curbs. S—Sidewalks. CB—Catchbasins. PO—Poles. WI—Wires. AP—Appearance.

Street Survey Data—Fig. 9

IV.

STREET CAR AND BUS TRANSPORTATION

PRACTICALLY all street railroad transportation in East Orange is across the narrow dimension of the city. The only possible means of getting from one part of the community to another by means of a street railroad line is by traveling either into Newark or Orange, and coming back again into East Orange. With one late exception, the automobile bus routes operated are in the same general direction.

Marketing and shopping is generally done either locally (within walking distance), or in Newark or New York. This is demonstrated by the relatively small number of business buildings in East Orange as compared with the number in most self-contained communities. Care has been maintained in locating schools so that children may reach them in almost every case on foot. Even the moving picture theatres, because of the facility with which they could be established, and the small audience required to create a paying investment, have located themselves in the small cub-centers of community activity.

It is only those individuals who desire to reach the City Hall, the Main Street theatres, one or more of the business offices, banks, or larger stores on Main Street, or those who desire to visit friends at the other end of the city, who demand crosstown transportation. The amount of travel in East Orange is remarkably small. According to the 1920 census, there were 12,416 families in the city, or an average of 4.1 persons per family. This may be taken to include one man, one woman and two children. Assuming that all the men work away from home, and that a large number of them walk either to the railroad station or to local business, it may be expected that not more than one-half the men will take two trolley rides per day, 250 days per year. It may also be assumed that each woman rides a trolley car three times a week. These assumptions would indicate 275 rides per capita per annum; an estimate which is shown below to be altogether too high for East Orange, although entirely normal in many other cities.

The following table shows the actual number of persons who boarded trolley cars and buses within the boundaries of East Orange during one day's riding on each line.

Route	Passengers	Trips
Central.....	254	26
Main.....	385	26
Dodd.....	76	16
Springdale.....	186	24
Total.....	901	92

Assuming that the same ratio of passengers per trip holds; that the number of trips per twenty-four hours is three times as many as the number during the time of observation; that each passenger who boarded a trolley car or bus returned by the same means; and that the daily figures obtained apply to 250 days per year, it is easily computed that the resulting rate of travel is only *twenty* rides per capita per annum. Thus the riding habit in East Orange is not strong, possibly because transportation facilities are inadequate, particularly in the north-south direction.

To ascertain the probable best routes for added transportation facilities, a population distribution spot map was used, on which were indicated bands one-half mile wide extending equally on each side of each existing transportation route. The areas not covered by such bands show the portions of the community not reasonably well served by existing easterly and westerly transportation lines, and the population spot map shows the population involved. One such district is the southerly portion of the city between Elmwood and Tremont Avenues. Another parallels Park Avenue from Park Street to Arlington Avenue, and extends from 500 to 1,000 feet on each side. A similar area parallels William Street (at about the same distance on each side) from North Arlington Avenue to the Newark line. Another small district exists on the easterly side of the Montclair Branch of the Lackawanna Railroad.

At least two transportation routes should be operated in the northerly and southerly direction. One such route has lately been established and is operating along Grove Street, connecting the Ampere and Grove Street stations and reaching Central Avenue adjacent to the cemetery. Another route should be laid out so as to connect the northwesterly section beyond the Orange Branch of the Erie Railroad with the Brick Church station and the main business district. This route should be extended through some such thoroughfares as Halsted Street and Sanford Street into Newark.

The gasoline motor vehicle is likely to afford the most economical method of transportation where the interval between trips is not under forty minutes. For intervals between ten and forty minutes, the lately developed trackless trolley is probably the most efficient device. It derives its power from trolley wires, but operates over pavements instead of rails. Where the headway is less than ten minutes, but more than about three minutes, the ordinary street car of large type design is probably best. With traffic of a density which would require frequency of three minutes and under, high speed rapid transit lines of the elevated and subway types are economically feasible.

Even with a riding habit considerably more developed than in East Orange, it is obvious that only motor buses can be profitably operated for either additional east and west lines or for the proposed north and south ones. The best plan would be a system of buses exchanging transfers with existing trolley lines and with other bus lines. At the present rates of fare of eight cents and ten cents respectively, and with the long hauls now required, a division of revenue on a fifty-fifty basis would seem reasonable. Transportation lines which may be established to operate in the north-south direction should extend entirely across the city into the neighboring municipalities. Preliminary studies indicate that such bus lines would pay; and franchises should be granted by the municipal authorities upon application from responsible parties.

V.

PARKS AND PARKWAYS

EAST ORANGE has no parks of its own. On February 26, 1900, the city turned over to the then recently created Essex County Park Commission a tract of land of a little less than $6\frac{1}{8}$ acres, known as Watsessing Park, which had formerly been used for a sewage-disposal plant. This tract was, and still is, operated largely as a playground and athletic field. In 1913, this land was appraised at \$167,000.

About three-quarters of an acre of Orange Park extend within the western boundary of East Orange.

There are within the limits of East Orange, only about 27 acres of parks and playgrounds. This means one acre of park and playground for each 2,000 inhabitants. This ratio is ridiculously small in comparison with these of other cities and towns, where the number of inhabitants per acre of park ranges from 100 to 700 with an average of from about 300 to 400. Usually, only parks, strictly so-called, are considered, and playgrounds are excluded, in determining this ratio. On this basis, East Orange has about one acre of park to each 10,000 inhabitants.

Partially compensating for this deficiency, one-half mile beyond the limits of East Orange, Watsessing Park in Bloomfield contains an area of 70.5 acres. Just outside of the East Orange limits, Orange Park in Orange contains 47.6 acres. Five-eighths of a mile outside of the city limits, Branch Brook Park in Newark contains 280.6 acres. A mile and a quarter outside of the city limits, West Side Park in Newark contains 27.0 acres. Two miles outside of the city limits, Eagle Rock Reservation in West Orange contains 408.5 acres. Two and a half miles outside of the limits, South Mountain Reservation in West Orange and South Orange contains a little over 2,000 acres.

Within Essex County, the Essex County Park Commission has provided a total of 3,500 acres of parks and reservations for a total of 652,089 inhabitants, or one acre for each 186 inhabitants. There are 521 inhabitants per acre of city parks in Essex County.

Of the total of 3,500 acres, only seven acres lie within the corporate limits of the City of East Orange, or only two-tenths of one per cent of the total.

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Location Development Street	Ac/Totals	Value of Land Taxes	Cost of Bulding on Building Basis M-1000	Permit/Plumbing Fees P-10000 E-10000	Default Fee for Late Action Penalties	Short Completion Penalty of 1000	Net G/L in Trade or Receipts	Net G/L in Inventory for Building Receipts or Trade LPT	Net G/L in Retail Receipts	Net G/L in Retail Receipts	Net G/L in Retail Receipts	Total Receipts of Public Money	Total Receipts of Public Money	Total Receipts of Public Money	Remarks
PARK AVE TO SPRINGDALE AVE.	140000 SALPINE DRG	-27500	B-9000 M-1000	P-10000 36000	-36700	+112000	-75300	+128000	203800	80500	122800	22500	ESSEX CTY		
SPRINGDALE AVE. TO LAFAYETTE AVE.	28800	-5000	M-3000	1200		+5000	+5000		5000	9200	-4200		ZONING SET BACKS ESSEX CTY		
BELGRADE AVE. TO HOFFMAN BOUL.	25000	-5000	B-60000 10000			+2000	+2000	-5000	7000	75000	-68000	1000 5000	ESSEX CTY		
HOFFMAN BOUL. TO N. 18th ST.	13000	-1400		1000	-1000	+14800	-13000	+28000	41000	2400	36000		ZONING SET BACKS ESSEX CTY		
BELGRADE AVE TO N. ARLINGTON AVE.	68000	-5000 17400		12000	-58000	+72600	-14000	+30000	44000	29400	14600	5000			
N. ARLINGTON AVE. TO N. WALNUT ST.	6000	-1200				+3000	+3000	-10000	13000	1800	11200		ZONING SET BACKS		
N. WALNUT ST. TO N. CLINTON ST.	9000	-2900		6500	-1400	+3600	+2200	-12000	14200	9400	4800	2300			
N. CLINTON ST. TO PROSPECT ST.	96000	-8700	M-500	35000	-8900	-53950	-45050	+110000	-150950	43700	111550	8200			
PROSPECT ST. TO GLENNWOOD AVE.	35000	-6000	B-3000 M-5000	1200		+9200	+5700	+14000	23200	15200	10000		ZONING SET BACKS		
ERIE ST. TO DODD ST.	65000	-7500	B-10000 16000			+1750	+1750	+5000	6750	33500	-26750	7500	ESSEX CTY		
GLENNWOOD AVE. TO N. PARK ST.	395000 14 OF PARK AND 60000	-19700	B-7500	P-10000 85000		-16200	+16200	+16000	32200	122200	-90000	19700	ESSEX CTY		
SOVEREL TER. TO SPRINGDALE AVE.	21000	-1000	M-500	1000		+15500	+15500	+13000	38500	2500	36000		ZONING SET BACKS ESSEX CTY		
SPRINGDALE AVE. TO E. PARK ST.	47000	-9550		12500	-4120	+24500	+20380	+53000	73380	21850	51530	9000	ESSEX CTY		
E. PARK ST. TO PARK AVE.	141000 ALPINE DRG	-11800	B-2800	P-20000 36000	-14050	+107500	+53400	+195000	288400	52300	236140	11800	ESSEX CTY.		
PARK AVE. TO MAIN ST. & L. W. R. R.	42000	-16000		2000		+10000	-10000		10000	17000	-7000		ZONING SET BACKS		
D. L. W. R. R. TO HARRISON ST. BELOW WEBSTER PL.	13600	-3000		600		+3000	+3000		3000	3600	-600		ZONING SET BACKS		
HARRISON ST. TO CENTRAL AVE.	107000	-24170	M-15000	40000	-12900	+61350	+46450	+110000	158450	69170	85280				
CENTRAL AVE. TO MELROSE AVE.	146000	-24725	B-9000 M-7000	52100	-11350	+95000	+43650	+118500	158650	92825	65825				
MELROSE AVE. TO PARK END PL.	62000 Home 200 10500		B-19000 M-1000	23000	-18500	+38200	-22700	+45000	67700	30000	17700	10500			
PARK END PL. TO S. ORANGE LINE.	154000	8550	B-20000 M-2000	57000	20400	68000	48500	165000	211500	69350	142150	8350			
PARK END PL. FROM HARRISON TO PARK AVE.	28000	2200 Car-1100		800 2400	1000	9000	8000	10000	18000	6500	11500		ZONING SET BACKS		
SARFORD ST. TO S. MUHN AVE.	102000	2700	M-21000	3000		5400	5400	25000	30400	26700	3700		ZONING SET BACKS		
S. MUHN AVE. TO NEWARK LINE.	44000	5600	M-1500	16500	2900	35300	32400	102000	134400	23600	110800	5600	ESSEX CTY		
NEWARK LINE TO GARFIELD PL.	72000	9200	B-3000 M-2000	27000		7900	7900	70000	25900	41200	-15300	9200	ESSEX CTY		
GARFIELD PL. TO CENTRAL AVE.	18000	3870	B-8000 M-4500	1000		13000	13000	5000	18000	27370	-9370		ZONING SET BACKS ESSEX CTY		
TOTALS	2151200 AREA OF WHICH IS 100000	274865	115000 B-9000 M-10000	571400 P-10000 E-10000		599020	1212000	1781020	921265	895755	124850				

Fig. 11

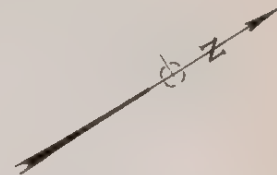
PORTION OF EAST ORANGE NEW JERSEY PARKS AND PARKWAYS CITY PLAN COMMISSION

TECHNICAL ADVISORY CORPORATION

CONSULTING ENGINEERS
NEW YORK
1921
NOTES

All valuations based on Assessed Valuation Duplicates
for 1920 and the "Newark" rule for deep lots, etc

SCALE
0 100 200 300 400 500 600 700



RECAPITULATION	
Block bounded by Park Ave, Glenwood Ave, Eastwood St, E Park St and Washington St	
Values taken	\$ 3,150
	2,200
	575
	4,100
Total	\$ 11,825
Rear values lost	\$ 1,200
	3,150
	600
	600
	1,100
	3,350
Total loss	\$ 14,263
New values gained	\$ 36,000
	54,000
	500
	10,800
	6,150
Total	\$ 107,430
Net gain on land only	\$ 8,625
Building gain on 26 lots	\$ 81,360
Building gain on 26 lots	\$ 495,000
Grand total	\$ 678,360

RECAPITULATION	
Block bounded by E Park St, Midland Ave, Springdale Ave, N Park and Washington St	
Values taken	\$ 3,700
	1,125
	3,500
	600
	2,000
Total	\$ 13,480
New Values Gained	\$ 500
	300
	330
	4,700
	1,300
	200
Total	\$ 24,330
Net gain on land only	\$ 13,480
Building gain on 26 lots	\$ 80,000
Building gain on 26 lots	\$ 5,000 per lot
Grand total	\$ 91,070

RECAPITULATION	
Block bounded by Springdale Ave, Glenwood Ave, Erie Railroad and N Park Sts	
Values taken	\$ 3,200
	3,000
	300
	3,600
	300
	2,500
	600
	600
Total	\$ 35,345
New Values Gained	\$ 1,000
	1,000
	1,000
	1,000
	1,000
	1,000
	1,000
	1,000
Total	\$ 33,700
Net loss on land	\$ 3,645

TOTALS	
Net gain on land	\$ 81,360
	\$ 13,480
	\$ 3,645
Net building gain	\$ 588,000
Grand total-Net gain	\$ 678,360

The total tax ratables of Essex County for 1921 were about \$800,000,000 of which \$69,000,000 were within East Orange. Thus East Orange is providing 8.62 per cent of the income of the County.

The 1921 budget of the Essex County Freeholders allots \$400,000 to the Essex County Park Commission. The sum of \$34,700 would be 8.62 per cent of this amount. Thus the share of East Orange capitalized at 5 per cent would amount to nearly \$700,000. If East Orange were to develop her own park system instead of participating in that of the county, she could afford a \$700,000 expenditure. An allowance of at least one-half of her annual contribution of \$34,700 should be available each year for carrying on her own park plan.

The above mentioned parks in Newark, Bloomfield and Orange barely provide for the needs of those communities, while the two large reservations are so far from East Orange that they can rarely be used by most of the citizens. Parks are of value only when they are easily accessible. The Essex County Park Commission owes the City of East Orange the effective service of at least 8.62 per cent of the total area of city parks in Essex County, or about 100 acres of parks. This would provide the city with one acre of park for each 500 inhabitants, which would be reduced to one acre of park for each 1,250 inhabitants when the city reaches its ultimate population.

The immediate problem within the City of East Orange is to acquire and develop 100 acres of park property. These parks should be properly distributed and should be connected by parkways or by streets of ample width. This requires, eventually, the widening of some of the tree and lawn bordered streets for which East Orange is famous. Fortunately, the Building Zone Ordinance will make eventual expropriation relatively cheap.

The city treasury should not furnish funds for parks or parkways. The city has all it can do to provide adequate playground space and facilities. Hence there arises the specific problem of so locating and laying out a park and parkway system as to make it pay for itself. This can be accomplished because experience has shown a considerable excess of betterments over damages has resulted, by reason of the increased ratables created on account of improved frontage or nearness to the parks and parkways, and also particularly on account of the new ratables produced by opening the centers of especially deep blocks to create new frontages. The parts of the park and parkway system which would pay for themselves from local benefit assessments could be taken care of by the city without increasing its budget; while the connecting links and other parts of the system which could not be made to pay for themselves should, in fairness, be financed by the Essex County Park Commission out of the county budget.

In laying out the system indicated in part on Fig. 10, several auxiliary maps were employed: special locations, unimproved property, building zones, distribution of present and future population, school and public property, land values, the proposed street system, and present and proposed Essex County Parks. The topography of the city was also recorded on a special map. This proposed park and boulevard system of which a typical part is shown in Fig. 10 is designed to connect at all available points with the general park system of the county.

A careful search was made for beautiful or picturesque natural features, such as water courses, woods or broken country. Very little land of this sort remains within the limits of East Orange. The best opportunity was that afforded by the brook that flows north from Watsessing Park under the Erie Railroad tracks, and some adjacent property.

As there is no connection now between the East Orange parkway and the speedway in Newark, it is proposed to continue the parkway southward along the edge of the cemetery, just east of Wilcox Place. It is obvious that the Newark park system should be accessible to the rapidly growing southern part of East Orange.

In order to secure appropriate connections between existing and proposed parks and parkways, it is further proposed that additional parkways be created by the widening and restriction of certain streets and stretches through deep blocks and along the best routes. The general map of the city shows the recommended scheme.

The accompanying table (Fig. 11) has been prepared to show the cost to the community of each element of the proposed system, and the profit or loss finally resulting.

In making the calculations leading up to this table, the following basic units were used. Land values were taken from the 1920 tax duplicate corrected for deep rear lot values by the "Newark rule." No value was added for corner lots. The unit value per front foot along new streets or parkways was rarely increased over the unit value per front foot of surrounding property. In other words almost no addition was allowed in these calculations for the undoubted increase in land values which would be occasioned by the development of a park and parkway system, such as has been the case in other cities.

Every attempt was made to avoid the unnecessary acquisition of existing buildings and the lines of improvement were diverted wherever feasible so as to reduce such cases to the minimum. Where buildings fell within the improvement, allowance was made for their removal, when possible, to another part of the same site or to an adjacent site. An allowance of from \$500 to \$2,000 was made for each building moved. Buildings to be expropriated were allowed for at their assessed values. Wherever it was deemed that the creation of the park and parkway system would tend to improve the character of new houses that would be erected along it, an allowance of from \$200 to \$2,000 was made for such improvement.

In calculating construction costs, the development of an 80-foot parkway was estimated at \$30 per lineal foot. Widening a street from 60 to 80 feet was reckoned at from \$1 to \$10 per lineal foot, depending principally on whether widening could be accompanied by moving back the street line or whether an actual widening of roadway and resetting of gutters and curbs would be necessary. The preparatory development of the parks, including planting and grading, was estimated at \$2,000 per acre.

Fig. 11 contemplates a complete system which entails acquiring 49 acres of land, (of which 11 would be in parks and 38 in parkways), including areas gained by the widening of certain existing streets. This is only half of the amount of park and parkway space that the Essex County Park Commission, in equity, owes the City of East Orange. With the existing parks, this system would provide one acre of park to each 800 of the present inhabitants of East Orange, or one acre to each 2,000 inhabitants of the ultimate population.

Acquiring the land for the complete system would involve the county and the city, over a long period of years, in purchasing property assessed at about \$224,865. The expropriation of existing buildings would add \$59,000 and the cost of moving other existing buildings would be \$56,000; total of three items, \$339,865 (assessed valuation).

The cost of improving the parks would be \$22,000. The cost of the parkways and their improvement would be \$479,400. The extra cost for two bridges under the Lackawanna Railroad tracks would cost about \$70,000. The total expenditure for these four items is \$571,400.

The grand total of \$911,265 is offset by the resulting increases in values of lands and of buildings facing on the improvements, and by the values of the new lots that would be created. It is estimated that the net gain in value of land benefited would be \$559,020, while the net gain in value resulting from the erection of buildings on these lots would be \$1,212,000. Thus the estimated total net gain in ratables is \$1,781,020. This is nearly double the total cost of the completed system (assessed valuation basis) to the county and the city. This total cost could be spread over a period of thirty years or more at the rate of about \$30,000 a year.

The most striking feature of this plan is that nearly half of the parkway system could be provided at once practically without cost to the city. No building will have to be expropriated. It will be merely a matter of widening the roadway and setting back the sidewalks and curbs. Land expropriation may be largely deferred, with complete assurance (thanks to the zoning ordinance) that no structure will be built on the land which must be eventually expropriated so as to widen the present streets to parkway width. To assure the complete system, however, building and land expropriation to the extent of \$124,850 should be provided for within the next few years at those points where expensive buildings might be likely to be erected in the near future. The acquiring of these properties alone will mean an eventual net gain to the city in added ratables of over \$600,000.

Nine of the thirteen proposed takings would so enhance surrounding property values that the

cost of expropriation could fairly be assessed in its entirety on abutting and neighboring properties. Seven of these thirteen takings are so located as naturally and logically to harmonize with the general development of the Essex County park system. Their acquisition should be undertaken by that Commission as the first step toward fulfilling its obligation to the city. The assessed value of these seven parcels is \$85,300. This leaves \$39,550 to be provided by the city in the near future to assure the balance of the system.

The final completion of those parts of the system not provided by county agencies could be undertaken by the city as an integral part of its thoroughfare plan. The cost to be assumed by the city could be spread over thirty years at the rate of approximately \$14,000 a year. From 50 to 75 per cent of this could be assessed locally. There is a splendid opportunity today, thanks to the distribution of unimproved properties and to the zoning ordinance, to acquire a park and parkway system at reasonable cost. As an example of the beneficial effect of parks on surrounding property, lots facing Elmwood Park, nine years ago, before its development, sold for \$11 a front foot. Today the same properties are selling at from \$100 to \$150 a front foot. The park system is an excellent investment, and the city which neglects park development is wronging future generations.

VI

SCHOOLS AND PLAYGROUNDS

THE revenues of the Board of Education in 1920 amounted to \$600,000. This Board controls nine elementary school buildings and one high school building and has recently purchased sites for a junior high school building, for another elementary school building and also for a gymnasium.

The new policy of the Board of Education will transfer one-quarter of the elementary pupils to three new junior high schools, leaving nine per cent of the total population in the primary schools.

PLAYGROUNDS

The Board of Education buys property, erects buildings and plans ahead for future growth with the approval of the City Council. It maintains recess playgrounds on the same property at six of its school buildings. The other four sites are so small that playgrounds even for recess use are barely adequate. In accord with modern policy throughout the country the Board of Education is now purchasing sufficient land for recess playground space in connection with each new elementary school building.

On July 1, 1907, on the recommendation of the newly created Board of Playground Commissioners, the city purchased the Orange Oval and the athletic field long used by the Orange Athletic Club, which lies just north of the Grove Street station of the Lackawanna Railroad. The tract covers six acres and cost \$52,000. It is used exclusively as a playground.

Elmwood Park, of nine acres in the southern part of the city, was dedicated to the city by the Elmwood Home Association in April, 1855, with a perpetual easement for park purposes. It was a swampy tract and was used as a dump for the city's ashes and rubbish until 1910, when it was laid out as a playground. The city has spent a total of \$7,500 on its equipment and \$34,734 for the construction of a drain. Mr. Alden Freeman has contributed about \$150,000 for improving the whole tract by grading and architectural decoration, and it is today probably the best known playground in Essex County.

Ashland Field, a five-acre tract, was purchased by the Board of Education in 1905 for about \$8,000 and about \$100,000 was raised by the sale of bonds to build the present stadium.

Columbian Playground, in connection with the Columbian School, covers about four and one-half acres. It cost \$28,000 in 1919. About \$8,100 has been spent in fencing and leveling.

In addition there are smaller playgrounds in connection with six of the other school buildings.

Since 1909 the Board of Education has turned over annually to the Recreation Commission during the summer months the schoolyard playgrounds.

The modern policy of educational and recreational development which is currently accepted throughout the country has long been in effect in East Orange. Briefly it is this: All children and younger people need exercise. It is essential to health and normal growth. As city population becomes more dense, natural play-places disappear. Experience has shown that the playground is not only the best substitute but that it acts as a strong creative force for better citizenship. Play should be conducted under competent supervision. Games, apparatus and service buildings are essential and they differ according to the age and sex of the child. The child under 10 or 12 years of age does not use a playground if he has to walk much more than a quarter of a mile to get to it. On the other hand, playfields for older boys and girls and for young men and women are currently used by those within a radius of a half mile or sometimes more. Playgrounds become inadequate when there are more than 300 children to be served by each acre of net playground space, regardless of the age or sex of the child. With two groups using each playground each day, a minimum of 70 square feet per child must be provided in each playground.

On this basis 25 acres of net playground space are the minimum necessary to take care of present needs in East Orange. There are almost exactly 25 net acres today, in the aggregate, in the playfields and school-yard playgrounds of the city. Unfortunately, however, about 10 acres of this land is yet undeveloped. The whole eastern and southern portions of East Orange are adequately provided with playfields, but the northwestern quarter is less adequately provided for, because the Ashland Field does not take the place of a playfield and the Franklin grammar school playground on Dodd Street is barely adequate for the growing needs of the younger children who attend the school.

A study of the probable eventual distribution of population shows that the number of residents in the northwestern quarter of the town will probably be doubled within the next twenty-five years. In particular, the part of the city between Park Avenue and Main Street, will be densely covered with apartment houses. Within from five to fifteen years, an adequate playfield must be provided for the first ward and the northern part of the second ward.

A study of the various data maps indicates a necessity for the purchase, by the city, of a 7½-acre tract on Woodland Avenue north of Park Avenue. This property is assessed today at \$48,000 and at present includes only one building. It is centrally located to serve as a playfield for the whole northwestern section of the town. Its early purchase is to be recommended, as it is otherwise destined for early occupation by expensive private houses.

Allowing an average of one acre for each of the school buildings and the accessory walks and planting, about 14 net acres of available recess playground space exist in connection with the nine elementary school buildings. While this space is adequate for school recess recreation, there are about 2,900 younger children who do not have proper summer recreation facilities in either the existing school playgrounds or in the playfields. The most acute case is at the Washington school, where over three-quarters of the children lack play space today. Fortunately two acres toward the west have just been purchased. At both the Lincoln school and the Ashland school, additional playground space is readily available in the adjoining deep back yards and this should be acquired within five to ten years in each case.

SCHOOL BUILDINGS

The two following tables are a result of a study of the data maps already referred to. These maps include a present and eventual population spot map, a zoning map, an unimproved property map, a unit land value map, a thoroughfare map, a street traffic map, and a school district map. The percentage of children in the elementary schools to total population within the school districts varies from 9 to 19 per cent. The larger percentages are in every case in districts where there is a large industrial or foreign-born population. In each case one-quarter of the pupils will eventually go to one of the proposed junior high schools.

A forecast of the population in each school district thirty years hence and again when the city reaches its ultimate growth about sixty years hence, shows (for example) that the Ashland school district and the Columbian, Elmwood and Nassau school districts will eventually have fully three

times their present population. This indicates the desirability of redistricting and of creating four or five new districts to make up the surplus, with an eventual population of from 6,000 to 11,000 people in each of the new districts. This would correspond with from 650 to 1,400 children in each school building, including the five new buildings that should be erected, except that one-quarter in each case would pass into the junior high schools.

The strategic locations for five new primary school buildings are shown by the tables and the City Plan Map. These sites are at present unimproved, or occupied by a few relatively inexpensive buildings. The Central junior high school should be built immediately, to be followed by the Elmwood junior high school in not over four years and the Springdale junior high school in not over eight years. The data maps point strongly to the desirability of adhering to the program contained in the body of this report. A study of values of land and building for each of the new or extended sites shows that except perhaps in the cases of the Elmwood, Washington, and Hudson sites, the possibility of the erection of expensive houses is too remote to warrant speeding up the purchase of the properties.

TABLE 1
EAST ORANGE, N. J.
SCHOOL AND PLAYGROUND DEVELOPMENT
CITY PLAN COMMISSION

Name of School	Area in Acres Present Site	Recommended New or Added Sites Acres	Number of Children That Can Use Present Summer Playgrounds	Number Lacking Summer Playground Space in 1921	When New Playground Space Will Be Needed Years	Date of Acqui- sition, Corrected by Property Purchase Conditions Years
Ashland.....	5	4	300	513	5	5
Eastern.....	2½	1	450	170	30	20
Franklin.....	4	...	700	62	..	..
Columbian.....	5½	...	1,300	...	..	..
Elmwood.....	1½	1	300	756	20	15
Nassau.....	1	...	150	332	10	..
Stockton.....	1	...	100	414	..	..
Lincoln.....	1½	2½	300	188	10	10
Washington....	1¼	2	100	439	Now	Now
High School....	3¼	½	400	1,065	..	..
Renshaw Ave. ..	3	½	...	...	25	20
Evergreen Pl....	...	2½	...	...	10	10
Hudson Ave.....	...	2½	...	...	15	15
Soverel Terrace..	...	4	...	...	15	15
Summit St.....	...	3½	...	...	30	20
Central Jun. High	1	...	...	...	..	..
Elmwood Junior High.....	...	4¼	...	...	..	4
Springdale Junior High.....	...	5	...	...	..	8

TABLE 2
EAST ORANGE, N. J.
SCHOOL AND PLAYGROUND DEVELOPMENT
CITY PLAN COMMISSION

Name of School	Pupils 1921	Population in School District 1920 Census	Per Cent Pupils to Population	Population of District 30 Years Hence	Eventual Maximum Population	Eventual Population of Redi- stributed Districts	Eventual Maximum Number of Pupils	When New Buildings Needed Years
Ashland.....	813	8,075	10	20,000	25,000	10,400	940	40
Eastern.....	619	6,625	9	9,000	11,500	9,400	860	20
Franklin.....	762	6,350	13	10,500	13,000	6,750	600	..
Columbian.....	827	4,225	19	11,500	14,000	11,800	1,050	35
Elmwood.....	1,056	6,000	17	13,000	15,500	7,500	680	..
Nassau.....	492	5,625	9	14,500	18,000	9,450	850	15
Stockton.....	514	5,275	10	7,500	9,000	8,700	790	25
Lincoln.....	488	4,400	11	6,000	7,500	7,500	680	30
Washington....	539	2,950	16	10,000	12,000	9,350	755	10
High School....	1,465	.....	3	.....	.....	.....	3,750	10
Renshaw Ave. . .	...	.....	.....	.....	.....	5,500	500	30
Evergreen Pl. . .	...	.....	.....	.....	.....	11,250	1,030	12
Hudson Ave. ....	...	.....	.....	.....	.....	8,000	695	25
Soverel Terrace..	...	.....	.....	.....	.....	6,000	550	16
Summit St. ....	...	.....	.....	.....	.....	10,800	990	20
Central Junior High.....	...	.....	3	.....	.....	55,000	1,650	Now
Elmwood Junior High.....	...	.....	3	.....	.....	35,000	1,050	4
Springdale Junior High.....	...	.....	3	.....	.....	35,000	1,050	8

VII

GARBAGE

THE time is approaching for East Orange when the question of disposal of ashes, refuse and garbage will become one of extreme difficulty. Garbage presents the most pressing problem. Incineration seems to be the one method of disposal to be considered in the absence of any possibility of disposition by dumping; and this is the only method contemplated in this report. The refuse left after burning garbage (including miscellaneous refuse) is only from 10 to 12 per cent. The refuse from the burning of ashes is about 83 per cent. The incineration of ashes is becoming increasingly difficult and unprofitable with poorer fuel and relatively greater efficiency in its use.

Incineration may be made productive by causing the burning waste to generate steam, and then using this steam to generate power or light or to manufacture ice. The value realized from steam production never (in this country) equals the total cost of incineration, hence the whole operation is one involving some expense rather than producing a revenue. The following table illustrates some of these points for East Orange conditions:

Operation on	I	II
	Garbage Only	Ashes and Garbage
1. Maximum daily tonnage.....	40	150
2. Cost of construction, including land.....	\$100,000	\$350,000
3. Overhead cost at 20% per year.....	\$20,000	\$70,000
4. Yearly tonnage.....	7,300	29,200
5. Overhead cost per ton—Item 3 ÷ Item 4	\$2.74	\$2.40
6. Operating cost per ton.....	.60	.60
7. Total cost per ton.....	3.34	3.00
8. Revenue from steam, per ton.....	1.00	1.00
9. Net cost per ton.....	2.34	2.00
10. Annual cost or loss.....	17,082	58,400

To these costs must be added those for hauling.

With any type of incinerator a certain amount of "auxiliary" fuel is required for starting fires. This amount may run from 20 to 50 lbs. of coal per ton of garbage in plants burning garbage only. Garbage is perhaps the most variable of all fuels in heat-producing quality. The rate of generation of steam from it is thus variable. The steam pressure is correspondingly unsteady. It is often necessary to install an auxiliary coal-fire boiler.

The cost of incineration is so high that careful attention should be given the possibility of reducing the cost by steam conservation. In the average American plant the steam does nothing more than drive the necessary plant auxiliaries. A large surplus of steam is usually wasted. It is reasonable to expect the production of 1 to 1½ pounds of steam (under technically "standard" conditions) per pound of garbage burned. Guarantees (somewhat conditional) of the latter figure are sometimes made. The value of this steam may conservatively be put as equivalent to the value of the coal which would have to be burned to produce it. On the basis of about 8 pounds of steam to one pound of coal, there should be then derived the equivalent of one-eighth to one-fifth pound of coal per pound of garbage; or with coal at \$6.67 per ton, 83 cents to \$1.34 will be the coal value realization per ton of garbage (short tons in both cases). For a rough approximation, \$1.00 may be taken as the average.

The total production of waste (ashes, garbage and refuse) in East Orange is in the neighborhood of 30,000 tons per year. The contract price for collection and disposition of ashes and garbage for for the next five years is \$85,800 per year or \$2.86 per ton. The previous price was \$63,946.68 per year or \$2.13 per ton. An additional sum of \$15,600 per year, or perhaps \$2.14 per ton of garbage alone, was paid in 1920 for the removal of garbage beyond the city limits. Hence the total cost of garbage collection and removal (estimated at 7,300 tons per year) is now probably about \$5.75 per ton. The figures of the table given above indicate a cost for incineration of \$2.34 per ton, to which must be added the collecting and hauling cost. The major portion of the city's waste is now

hauled to the city limits. If an incinerator plant were located close to the center of collection, the present contract cost for collecting and hauling would be considerably reduced. Assume, therefore, the contract hauling cost to be reduced 30 per cent (it may be 50 per cent) to \$2.00 instead of \$2.86. Add 11 per cent of \$2.86 or \$0.32, to cover the hauling of incombustible garbage residue to the dump at the city line. This gives a total collection and haulage expense, with incineration of garbage, of \$2.32 per ton. Adding this to the cost of incineration, the total expense per ton of garbage is \$4.66 per ton, as compared with a present expense of \$5.75 per ton. The difference amounts to \$7,957 per year, which would be the present net saving, over and above a fair rate of interest on plant, and a sufficient amortization fund.

The excess capacity of plant which should be initially provided would, as the city grew, become more and more of an asset. The city could look forward to a progressive decrease in unit cost of operation. Under present conditions, it looks forward to an increased cost and greatly increased difficulty in disposition at any practicable or permissible cost.

Many municipalities have had costly and distressing experiences in their handling of the garbage problem. East Orange must act, and act at once, but it should (as it were) feel its way toward a correct solution.

In the light of quantitative data determined exactly, the various methods of carrying off ashes should be examined for East Orange conditions. Among the alternatives possible are:

- (a) Development of new nearby dumping sites for clean ash.
- (b) Hauling away by trucks and trailers.
- (c) Hauling away by rail (transfer facilities necessary).
- (d) Screening, followed by incineration of the more combustible portions.

In the very near future plans and specifications should be prepared, and bids received, for a garbage incinerator plant. With a view to full utilization of steam, this should be located within a few blocks of the geographical center of the city. The immediate daily capacity should be 50 tons, and the immediate equipment should be planned for garbage only. The land purchase, arrangement of approaches, size of chimney and certain other more permanent features, etc., should be determined by the proposed ultimate capacity of plant. This ultimate capacity would probably be that resulting from the addition of another 50-ton unit.

The general location recommended has several advantages. It has the disadvantage of involving rather high land values, and of being near a part of the city where an incineration plant may be objectionable. The amount of land investment can be kept down to \$12,000. A properly designed, constructed and operated incinerator is not a nuisance. The objection to a 150-foot chimney in this part of the city can be met by treating the chimney architecturally. A liberal allowance for this decorative feature might increase the immediate cost of garbage disposal by 20 cents per ton.

The whole cost of this undertaking would be about \$115,000. This could be met by a bond issue in 1926. It will be conservative to assume no revenue from steam production the first year. The adequate economic utilization of steam should be accomplished during the second year of operation, or sooner, if the city is prepared to provide the necessary capital. The most obvious method is in connection with the heating of the proposed new city hall. Probably a \$2,500 expenditure would be involved for the pipe lines. Nearly all of the fuel which would otherwise be burned in that building would thus be saved. Fluctuations in steam pressure or supply can be compensated for by maintaining an auxiliary boiler with a banked fire, in either the city hall or the incinerator plant. The full value of incinerator steam will not be realized. To use steam for heating alone employs it only partially. Further, heating furnishes employment for the winter steam only.

By installing an electrical generator driven by a steam engine, within the incinerator plant, there will be made available electric current which will vary from 700 to 1,800 kilowatt-hours per day, according to the season of the year. This would give an average output of perhaps 60 kilowatts in winter and 240 kilowatts in summer, during the hours when light is required. In view of the utter inadequacy and inefficiency of the street lighting system of East Orange, an initial electric lighting

development of at least 60 kilowatts should be contemplated. This would suffice to illuminate the whole of Main Street in a modern and satisfactory manner.

A 60 kilowatt plant installation, including engines and generators in duplicate (to insure against breakdowns), switchboard and auxiliaries, would cost about \$17,000. With overhead at 15 per cent, the annual overhead cost would be \$2,550. The distributing system and lamp standards, if of a type likely to meet with approval in a city like East Orange, will be expensive. Probably \$25,000 would be the minimum appropriation. On this investment, overhead charges at 12 per cent would be \$3,000 per year. Thus the total overhead expense is \$6,550 annually. Operating costs, including labor, repairs and lamp renewals, might come within \$1,450 per year, resulting in a total cost of \$7,000 annually. The superintendence provided for the incinerating plant could no doubt cover this enterprise as well. Assuming all-night lighting, 4,000 hours per year, the resulting total cost is equivalent to 2.92 cents per kilowatt hour. (The contract rate for the new Main Street lighting is about 3.46 per kilowatt hour). As the result of this expenditure, there would be obtained (over a limited area) eight times the present light for less than twice the cost.

The manufacture of ice should be considered as a suitable method for disposing of excess steam. East Orange can never derive all of her lighting from garbage fuel. She cannot do any of it for at least a year; possibly not for two years after the garbage plant is built. Within that time, some other source of electric current may develop. If the lighting of a fraction of the city electrically will be an acceptable improvement, then the ice plant is to be considered only as one possible means for disposing of excess steam generated from the burning of garbage during the summer and not necessarily the best possible means. If the city is unwilling to undertake a partial lighting plan, then ice-making furnishes a method for steam utilization which has several features of advantage. For ice-making, fluctuations in pressure and quantity of steam are less important than in electrical generation. The maximum demand occurs in summer, when the available quantity of fuel is a maximum. The cost of installation compares favorably with that of electrical plant and equipment. Other municipalities are contemplating ice manufacture. This subject should be considered in detail after the city has determined as to its general policy in connection with the questions here raised.

VIII

SEWERS AND STORM DRAINS

IN EXAMINING the sewer problem, the first step was to bring down to date the map in the office of the City Engineer showing the sanitary sewer system. Upon this map were indicated sewer pipe sizes and the grades to which the pipes were laid (wherever this information was available). In many cases, the grades have not been computed, but the elevation of the pipe at the bottom of each manhole was given, and this information was employed in computing the grades. A pipe of given size laid at a definite grade will carry only a certain amount of water when the flow is under the action of gravity alone. This quantity was determined for the lower end of each run of pipe of each size, and also where marked changes of grade had been introduced.

The amount of sewage in practically every city is substantially equal to the water consumption (where both systems are in operation).

The average daily per capita water consumption in East Orange is $61\frac{1}{2}$ gallons. The maximum hourly flow was determined by the application of a proper factor to the twenty-four-hour average. By dividing the computed maximum flow in each section of sewer by the per capita figure for flow, the total population was ascertained for which the sewer system in each of its parts was adequate. A population spot map was used to ascertain the number of individuals housed in 1920 on each section of the sewage system. Wherever the actual population exceeds that for which the sewers are designed, overflowing is to be expected with its attendant annoyances. All such points of actual and possible trouble were indicated.

Information was then independently secured from the office of the City Engineer as to those parts of the system in which difficulty was occurring. In nearly half the cases, difficulties had occurred at the very points where the computations indicated they might be expected. The following tabulation gives the result of these computations:

Street Name	Between Two Streets	Sewer Size Inches	Computed Limit of Population	Actual Tributary Population	Remarks
Rhode Island Ave..	Eppirt & Shepard	10	2,180	3,575	Trouble often experienced
Rhode Island Ave..	Shepard & Oak	12	3,600	3,875	.....
William	Munn & Parkway	15	8,600	11,325	Trouble experienced
Thompson	Park & Springdale	18	14,800	15,475	.....
Amherst	Central & Harvard	10	2,400	4,325	.....
North Clinton	Summit & Park	12	4,600	7,925	.....
North Clinton	Hamilton & Springdale . .	15	8,000	9,425	.....
Dodd	Fulton & Glenwood	10	2,500	4,475	Trouble often experienced
Springdale	20th & 21st	24	19,200	36,375	Trouble often experienced

Practically all of the sewer mains, ten inches in diameter and larger, are inadequate and will continue to grow more so as population increases.

After thus investigating the sanitary sewer system of East Orange, attention was turned to the storm drainage system. A storm drain map was prepared, again showing the sizes and grades of the drains. Computations were made of the quantities which could be carried by the existing trunks. After determining these quantities, an investigation was made of the amount of rainfall which might be expected to reach the trunk drain at each point examined. Such quantity was so computed as to show the proportion of the total which comprised all impervious areas like building roofs, street pavements and paved areaways, from which the rain water might be expected to drain directly into the storm drains. A rate of rainfall of two inches per hour for a duration of fifteen minutes was assumed in making this analysis. Where a storm drain crossed the boundary of East Orange into an adjoining municipality, the proportionate quantity of rainfall was computed. The per cent of impervious area for which provision has been made, varied from 3.7 per cent to 14.4 per cent of total areas, as shown by the following table:

Street Name	Drain Size	Impervious Area Per Cent
Brookwood	8'-0'' x 7'-9''	8.3
Grand Avenue	78''	9.4
Whittlesey	Two 24'' pipes	3.7
Ninth Avenue	27''	4.7
Hedden Place	33''	3.7
Fourth Avenue	3'-6'' x 8'-0''	14.4
Leslie	3'-6'' x 13'-0''	8.0
Roosevelt Avenue	45	4.0
Woodland Street	54	7.2

The present paved area in East Orange, including roadways and sidewalks, amounts to only 25 per cent. The zoning ordinance permits approximately 30 per cent additional of private property to be covered by buildings in Residence Districts and as much as 75 per cent in Business and Industrial Districts. This will greatly increase the proportion of impervious area at a progressive rate, beginning at an early date. The storm drainage system therefore needs immediate attention and heavy expenditures will eventually be necessary to provide against flooding and resulting damage,

Estimates of future population and the following method of analysis proposed for financing large public improvements will minimize the cost for both sanitary sewers and storm drains.

DETERMINATION OF FUTURE SANITARY SEWAGE FACILITIES ON THE BASIS OF ESTIMATED POPULATION GROWTH

In what follows, an endeavor has been made to determine the proper policy to be followed with respect to sanitary sewer extension. The method adopted will be found applicable to other features of the municipal expenditure program.

The general type of problem which suggests itself in all of these cases is that of determining the desirable magnitude of any increase in facilities. The basis for any discussion of this problem seems to be purely financial. In all cases the facilities are assumed to be continued in use indefinitely.

It is necessary to determine which course involves the larger present expenditure: *i.e.*, to build two small sewers, one now and one later, to build one large sewer now. The two small sewers, even though of the same capacity as the one large sewer, will cost more, but the money need not all be made available immediately. The best solution is reached when the difference between the cost of one large sewer and one small one is equal to that sum of money which, set aside now and compounded annually, will equal the cost of another small sewer by the time such second sewer becomes necessary.

A start was made by establishing a relation between cost and capacity. Cost records for a large number of sewers of different sizes were tabulated and the costs in relation to the sizes plotted. These were then reduced to such basis that the cost of a twelve-inch sewer, in proportion to its capacity, was represented by the figure 100. These results were plotted and a smooth curve was adopted as the basis for further study.

It was then assumed that no sewer smaller than twelve-inch would be contemplated. On the basis of the population curve, this would last the city for ten years or until its population was 70,000. Another twelve-inch sewer installed after ten years' time would last for fifteen years more, or until 1946, at which time the population promises to be 90,000.

Assume the cost of a twelve-inch sewer at the present time to be \$1,000,000. Assume also the cost at the present time of a sewer equal in capacity to two twelve-inch sewers to be (from the accompanying curve) \$1,560,000. There exists the option of spending \$1,560,000 now, or of spending \$1,000,000 now and another \$1,000,000 ten years from now. From the compound interest tables, it appears that \$614,000 invested now would realize \$1,000,000 in ten years' time at five per cent. Hence there is the alternative of spending \$1,560,000 now as against spending and investing \$1,614,000 now. The former course is preferable by \$54,000, and this leads to the conclusion that the more economical course is to install now one large sewer having a capacity equivalent to those of two twelve-inch sewers. It may be noted that if the twelve-inch sewer were likely to be adequate for *fourteen* years' time, then two twelve-inch sewers installed, one now and one in 1935, would be more economical than the one large sewer installed now, by \$35,000.

The population is growing at too rapid a rate just at present to permit of small increments of sewer capacity. When it begins to grow more slowly, as it is likely to do after 1930, then the small increments will become desirable.

If the program which has been outlined is followed, and one large sewer is installed now, it will be adequate until 1946, by which time another sewer will be required, and if this is made twelve- or fourteen-inch, it will be likely to serve the city indefinitely without any further additions.

The problem suggests at once the question, what is the exact period of adequacy which determines the desirable present course?

From simple mathematical considerations, it appears that twelve years is the strategic period if the interest rate is 5 per cent. That is to say, it is indifferent whether the larger sewer or the smaller sewer be built now, if the smaller sewer would last for twelve years. It has been seen that it will last for only ten years; hence the larger sewer is better. If the population is going to increase by 20,000 in any period less than twelve years, then the larger sewer is better. The indications are that it will show such increase within the next ten years. After 1931, it will probably require at least fifteen years for the population to grow by 20,000; hence no future sewer of such large size as is now contemplated will ever hereafter be necessary, or economical.

The general method to which reference has been made can be applied to any specific East Orange problem of this kind by working out values for proportionate costs of different sizes of equipment. To make this possible it is, of course, always necessary to have a curve of the type accompanying this report. Such curve must show the unit costs, *i.e.*, the cost per unit capacity, for installations of various capacities, and it is the almost unvarying law of such curves that they assume the general form here exemplified. This general form is characterized by a rapidly decreasing unit cost as sizes increase while the sizes are small, and then by a reduced rate of decrease as sizes grow larger until finally, at some very large size of installation, the cost per unit of capacity is practically independent of the capacity. This is equivalent to saying, in other words, that the total cost for very large sizes is directly proportional to the capacity. In addition to this kind of information, it is also necessary to know, at least approximately, the probable future shape of the population curve.

There is one practical consideration which may modify the conclusions herein reached. Any marked change of unit prices during the course of the next ten years will affect and perhaps control the solution. More specifically, if prices decline seriously during the period suggested, it may prove wiser to install the smaller equipment now and contemplate duplicating it after ten years, at a then lower cost. For this course to be advantageous, commodity prices between 1921 and 1931 would have to decline something like 10 per cent. The trend of commodity prices over long periods and generally is upward. It is general experience that wars and other weighty factors produce bulges and slumps in the general course of commodity prices, but that after a varying period of time the normal course is resumed. The length of the disturbance created by war has usually been short—sometimes surprisingly short. The recent war is so exceptional that it might be hazardous to assume a return to “normal” conditions within ten years. A few economists maintain there will be a decline in prices for a generation to come. The rapid decline of the last six or seven months more or less discounts this expectation and is in line with previous experience. There may be a further decrease—to what level cannot be guessed. It will certainly be followed by an approximation to the general course of commodity prices during the past three or four centuries. From the speculative standpoint, the man who gambles that prices will be ten per cent lower in 1931 than now is probably taking the more risky end of the bet. Hence the probable best course is to install the larger equipment at the present time. The only sound argument against such course is the argument in favor of taking no chance whatever when spending money.

If the small equipment is installed now, there is a bare possibility of saving some money in 1931. If the large equipment is installed now there is no such possibility. The possibility in any case is so small that installation of the large equipment now is the recommended course.

CIVIC CENTER

EAST ORANGE has an exceptional opportunity. The city is in a plastic state just now due to the elevation of the Lackawanna tracks, and to the fact that the city and the Lackawanna Railroad are rapidly acquiring property. The city must soon build a junior high school, a public gymnasium, a headquarters for the police department and something to replace the overcrowded city hall. The federal government is committed to build a new postoffice and the War Memorial Association is planning to erect a memorial. Now is the time to determine how most of these buildings can be grouped so as to create a harmonious combined effect, and help one another and the whole community by providing an architectural center of which the city could well be proud.

Obviously such a civic center must be near the geographic and population centers of the community. It must be accessible and must be where it can be seen by visitors. It must be large enough in its conception so that the city will not outgrow it, and it must have space about it. Every advantage should be taken of land now owned by the city, the federal government and the railroad; and in buying new land the city must be economical. The gist of the problem is to find somewhere near the center of the community a plot of land of several acres, preferably on or near Main Street, but not too highly improved. In selecting the best location the various factors which influence the selection of a site must first be determined. Next, the relative importance of each should be fixed. On the basis of such weighted factors, various sites can be compared, element by element. The final sums of the weighted values of all elements will then measure the relative total advantages of the various sites.

This process was followed with reference to nine possible civic center locations in East Orange. Three main headings were first selected as main factors. They were "location," "reaction effects" and "design." The "reaction effects" were allotted 15 per cent of the total weight. "Location" and "design" should doubtless be differently weighted, depending upon the specific problems involved in the selection of a site. Where a site has to be selected for a fairly definite design, the problem is not the same as in a case where a site is to be selected almost irrespective of the specific design of the structures to be located upon it. In the latter case it is the idea that adequate designs can be secured for any site of reasonable size. The latter alternative was the one which existed in East Orange. After careful study, 55 per cent was allotted to "location" and 30 per cent to "design."

Subdivisions were then made of the main factors. That of "location" included such items as site topography, local traffic problems, proximity, and cost of real estate. The item of proximity was again subdivided to cover present and future relationships and, under each heading, where pertinent, various special proximities were listed.

Under "reaction effects" were included resulting effects upon highway and street car traffic; semi-nuisance influences upon the civic center from surrounding property uses, street traffic density, trunk line railroad operation and other railroad factors; increases in land values due to the creation of the civic center; changes in population distribution from the same cause; changes in the business district; necessary modifications of traffic routes; advertising effect of a fine civic center in East Orange upon through travelers by motor, railroad and trolley; increased civic pride; and various incidental items.

The initial cost of acquisition of real estate and improvements was given due weight, also the possibility of taking advantage of land or buildings already belonging to the city or state as an integral part of the group.

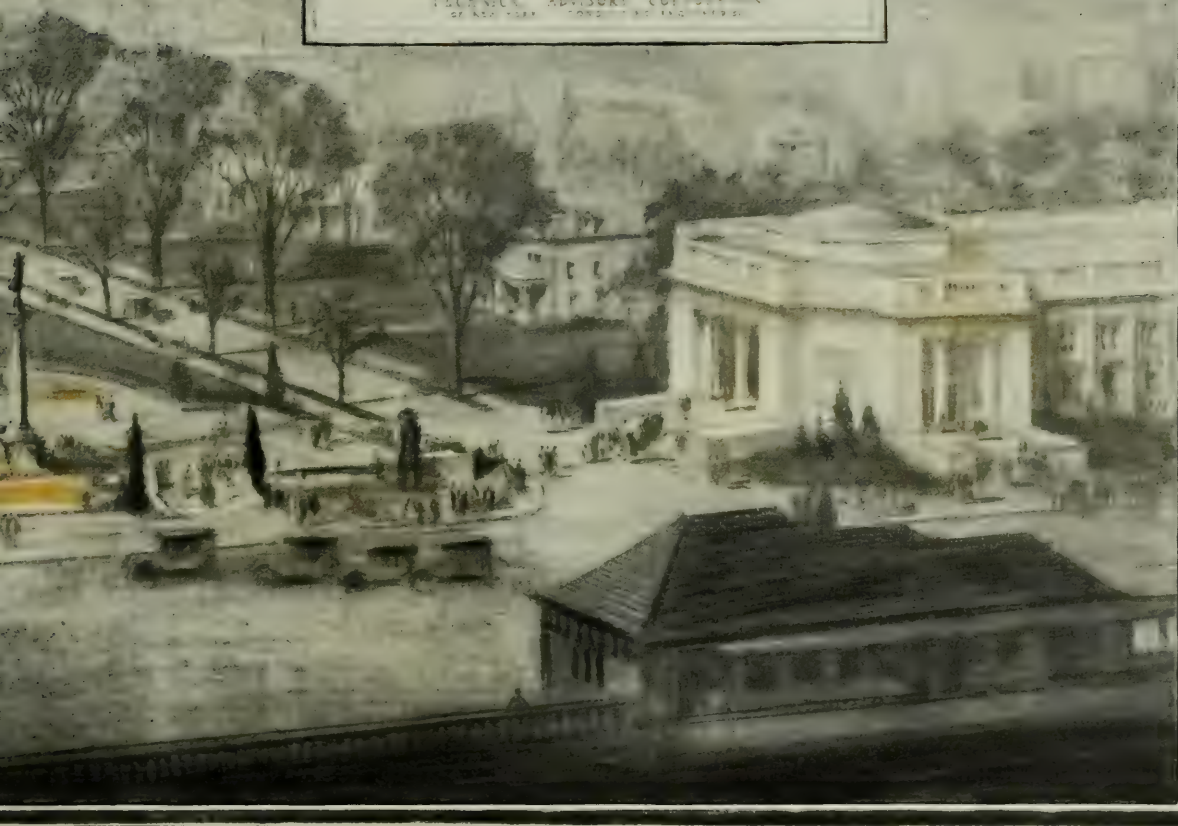
These many factors with their relative weights were then listed and each of the nine sites considered with reference to each factor. Each site was given a rating representing its relative value. Where sites were considered equal the same values were placed upon them. The rating which represented the order of desirability of the site was then multiplied by the weight assigned to the factor under consideration and the sums of such weighted products computed.



Fig.

CIVIC CENTER
• EAST ORANGE •

RECOMMENDED BY THE CITY OF EAST ORANGE
TECHNICAL ADVISORY CORPORATION
OF NEW YORK CONSULTING ENGINEERS



The accompanying table (Fig. 13) shows the distribution and summation of the several weighted ratings. The complexity of the case did not make it possible to predetermine the results, so that it is believed the method followed gives a fair indication of the relative values of the several sites investigated. The table shows that the recommended location between North Arlington Avenue and Winans Street opposite the new East Orange railroad station is the best among the several sites discussed, with the site between North Munn Avenue and North Arlington Avenue ranking second. No consideration should be given to the others in comparison with these two.

The perspective insert shows how the new city hall could be located in front of the junior high school building, with a memorial forecourt between the city hall and the station plaza. The new postoffice on the site already bought by the government would face on one side of this forecourt, the new stores being built at the corner of Main Street and Winans Street would face on the other side, and the new Lackawanna station would also form part of the group.

Obviously this site or any other adequate site would cost a large sum of money. The city is already heavily obligated for track elevation work and other public works.

The track elevation and the erection of the new stations is certain to stimulate the immediate building of stores and other commercial structures on the available property immediately around the stations. Once these structures are built the opportunity to create an adequate Civic Center will be lost to East Orange and thereafter nothing but a make-shift will be possible. Whatever may be necessary to control the situation should be done immediately and a plan should be found whereby, for the minimum expenditure, the City of East Orange can anticipate the possible erection of costly structures on any part of the proposed site.

To this end the following program is proposed. The plan will cost the city very little money now and at the same time it will give it an adequate return on its investment until the time when the city is ready to erect a city hall and complete the forecourt.

The lots on the accompanying map (Fig. 14) which are marked A, B, C and D have been deeded by the Lackawanna Railroad to the city as a station plaza. The portion marked Y, formerly part of the old station plaza, has been added to the postoffice site, and the portion marked X of the old plaza has been added to the private plot W, leaving Arlington Place only 40 feet wide.

The plots E, F, G, H, I and J are owned by the Lackawanna Railroad. Plots G and H, 150 feet deep, are now unimproved and are likely to be developed immediately into stores. These two lots were assessed at the original depth of 250 feet for \$31,000. Applying the Newark rule for the percentage of unit value for lots of various depths, the present assessed value of G and H would be \$26,700. The corner lots E and F are improved by a corner building assessed at \$7,000 and by several appendages in the rear whose assessed value is included in the above. The total assessed land value of C, D, E and F is \$13,800. They formerly averaged 120 feet in depth. As they are now only 80 feet deep, the present value by the Newark rule is \$9,200. The front and more important portion of the corner building is cut off by the station plaza. The severed front can be patched up temporarily, and made to produce sufficient revenue to cover carrying charges on half of the lots E and F.

It is strongly urged that the city buy immediately the properties E, F, G and H. They have an assessed value of \$35,900 for the land and \$4,000 for the balance of the building, or a total of \$40,000. It is then recommended that the city patch the facade of the building so that it may produce revenue, and that the buildings C and B be moved back on to the properties F and G and leased on short-term leases, and that H also be leased on a short lease for a temporary building. Thus the city would have a revenue from the property that would carry it satisfactorily until the time arrived to build.

The city should take an option on the property I, at present assessed for \$8,000 on the land and \$1,500 on the house. The value of this land is increased at least to \$12,000 by the fact that it now becomes a corner property available for business. As long as the Lackawanna Railroad is content to leave the property in its present state, deriving a fair revenue from the rental of the house, the city need do nothing about its option. But if the railroad should receive a satisfactory bonafide offer for the property, the city should take up its option and continue to lease the house—even for business purposes—until ready to complete the forecourt.

CIVIC CENTRE

EAST ORANGE, N.J.

APPENDIX 9

VALUES OF ELEMENTS USED IN THE DETERMINATION OF THE BEST SITE OF CIVIC CENTRE
CITY PLAN COMMISSION
TECHNICAL ADVISORY CORPORATION
CONSULTING ENGINEERS



Weight factor $\times A = B$

SITE NUMBER		1	2	3	4	5	6	7	8	9
LOCATION	Weight Factor	Arlington Pl. & Arlington Ave	N. Walnut St. & Main St.	N. Clinton St. Main St. N. Burnett St.	N. Munn Ave. Arlington Pl. & Orange Parkly.	N. Munn Ave. Main St. Jones St.	Winans St. To N. Arlington Ave.	Main St. East to S. Walnut St.	N. Munn Ave. To N. Arlington Ave.	Parkway & Main St.
1 TOPOGRAPHY	4	5 20.0	4 16.0	2 8.0	9 36.0	6 24.0	1 4.0	7 28.0	3 12.0	8 32.0
2 SIZE	1	7 7.0	8 8.0	4 4.0	3 3.0	9 9.0	2 2.0	6 6.0	5 5.0	1 1.0
3 COST OF LAND	14	8 112.0	4 56.0	9 126.0	1 14.0	7 98.0	2 28.0	3 42.0	5 70.0	6 84.0
B PROXIMITY-PRESENT 1 CITY HALL	0.5	3 1.5	1 .5	5 2.5	7 3.5	8 4.0	2 1.0	4 2.0	6 3.0	9 4.5
2 BUSINESS CENTRE	2.0	5 10.0	2 4.0	1 2.0	7 14.0	8 16.0	4 8.0	3 6.0	6 12.0	9 18.0
3 POPULATION-CEN	1.5	3 4.5	1 1.5	6 9.0	7 10.5	8 12.0	2 3.0	4 6.0	5 6.0	9 13.5
4 AREA CENT.	0.5	4 2.0	2 1.0	2 1.0	7 3.5	8 4.0	3 1.5	6 3.0	5 2.5	9 4.5
5 R.R. STATIONS	1.5	2 3.0	8 12.0	9 13.5	3 4.5	4 6.0	6 9.0	5 7.5	1 1.5	7 10.5
6 TROLLEY CENT.	1.5	1 1.5	1 1.5	1 1.5	4 6.0	1 1.5	3 4.5	2 3.0	3 4.5	1 1.5
7. PARK Do.	2.5	5 12.5	8 14.0	9 22.5	1 2.5	3 7.5	6 15.0	7 17.5	4 10.0	2 5.0
PROXIMITY FUTURE 1 BUSINESS CENTRE	3.5	5 17.5	2 7.0	1 3.5	7 24.5	8 28.0	4 14.0	3 10.5	6 21.0	9 31.5
2 POPULATION Do.	2.0	3 6.0	1 2.0	4 8.0	7 14.0	8 16.0	3 6.0	4 8.0	5 10.0	9 18.0
3 AREA Do.	1.0	4 4.0	1 1.0	2 2.0	7 7.0	8 8.0	3 3.0	6 6.0	5 5.0	9 9.0
4 R.R. Do.	1.5	2 3.0	8 12.0	9 13.5	3 4.5	4 6.0	6 9.0	5 7.5	1 1.5	7 10.5
5 TROLLEY Do.	1.5	1 1.5	1 1.5	1 1.5	4 6.0	1 1.5	3 4.5	2 3.0	3 4.5	1 1.5
6 PARK Do.	2.5	5 12.5	8 20.0	9 22.5	1 2.5	3 7.5	6 15.0	7 17.5	4 10.0	2 5.0
C REACTION EFFECTS 1 TRAFFIC CHANGES	5.0	9 45.0	4 20.0	8 40.0	2 10.0	7 35.0	5 25.0	3 15.0	1 5.0	6 30.0
2 NUISANCE FEATURES	3.0	8 24.0	3 9.0	4 12.0	6 18.0	7 21.0	1 3.0	8 24.0	2 6.0	4 12.0
3 CIVIC CENTRE	5.0	6 30.0	7 35.0	3 15.0	5 25.0	9 45.0	2 10.0	8 40.0	1 5.0	4 20.0
4 INCREASE OF VAL.	4.0	6 24.0	7 28.0	2 8.0	8 32.0	5 20.0	4 16.0	3 12.0	1 4.0	9 36.0
5 CHANGES IN POPUL	5.5	5 27.5	4 22.0	8 44.0	2 11.0	1 5.5	7 38.5	9 49.5	6 33.0	3 16.5
6 Do. BUSINESS	1.5	8 12.0	5 7.5	9 13.5	3 4.5	7 10.5	4 6.0	1 1.5	6 9.0	2 3.0
7 Do. TRAFFIC	3.0	1 3.0	2 6.0	3 9.0	7 21.0	4 12.0	8 24.0	9 27.0	6 18.0	5 15.0
8 CIVIC PRIDE	2.0	4 8.0	3 6.0	2 4.0	7 14.0	9 18.0	5 10.0	8 16.0	1 2.0	6 12.0
DESIGN	3.0	3 9.0	4 12.0	1 3.0	3 9.0	2 6.0	1 3.0	3 9.0	1 3.0	2 6.0
TOTALS	100	482.0	411.5	416.5	381.5	476.0	290.0	448.5	290.5	454.5

Note: Least Total Indicates Best Site

Site #6 Recommended

Fig. 13

The city should also take an option on the rear halves M and N of the lots L and K. These two rear halves would serve as a site for the eventual City Hall building. As properties L and K are each 200 feet deep and as each is assessed at \$10,000 for the land, an application of the Newark rule would put the value of the rear half of each lot at \$2,500. The outbuildings on these two rear halves are worth approximately \$900. Thus the total property is worth \$5,900 at present assessed values. These options should not be taken up by the city until it is ready to erect the City Hall, unless the owners of L and K can show that they will be damaged if they are not allowed to put up expensive buildings on the rear halves of their lots.

Plot J, which is owned by the railroad, and plots O and P, which are owned privately, will be needed eventually, to complete the forecourt. Each plot has at present a good revenue-producing building, so there is little likelihood of sale or of the erection of new expensive structures on them for some time to come. The city should take an option on them, but should exercise its option on any one of these properties only in case the owner can prove that he is being damaged by not being allowed to sell the property for the erection of a new building. Plot J is assessed at \$8,400 for the land and \$2,500 for the building. Plot O is assessed at \$1,500 for the land and \$9,200 for the building. Plot P is assessed for \$2,800 for the land and \$2,000 for the building; the three parcels giving a total of \$12,700 for land and \$13,700 for buildings.

There remain six properties: Q, R, S, and T, and the shortened lots L and K. The new City Hall can be built and the memorial forecourt completed without touching any of the properties Q, R, S or T or the buildings on L and K. It is recommended, therefore that the city should not now concern itself with taking options on any of these six properties. If at some future date one or more of the six owners should show damage then the city should exercise the right of eminent domain and expropriate the property at its then appraised value. Property Q is assessed at \$2,000 for the land and \$5,500 for the building; R at \$3,000 for the land and \$3,000 for the building; S at \$2,700 for the land and \$2,500 for the building; T at \$3,300 for the land and \$3,000 for the building. The balance of K is assessed at \$7,500 for the land and \$4,000 for the building; L at the same valuations. For these six parcels, the total value of the land is \$26,000 and that of the buildings \$22,000.

If at some time in the future the city or some private group should desire to acquire a site facing on the memorial forecourt for a public or a semi-public building, it should take over plot V on North Arlington Avenue, north of the postoffice site, which is assessed at \$10,000 for the land and \$7,000 for the building.

It is also strongly recommended that eventually, in order to complete the Civic Center group, the city or some private institution should erect a public or semi-public building, harmonious in character with the City Hall and postoffice, on site Z at the corner of Main Street and Winans Street.

The city should eventually acquire 30 feet of the southerly portions of Y and X, formerly parts of the old station plaza, so as to increase the effective width of Arlington Place from 40 feet, as shown on the railroad plans, to 70 feet. This is essential for adequate east and west circulation and to provide proper parking space for automobiles. This should be done for plot Y in time to control the location of the new postoffice building and for X in time to prevent its being sold for stores.

By following this program, the city can control the only satisfactory City Hall site for a small immediate expenditure and can earn revenue on this expenditure which will carry it until the city is ready to move further. If each of the public buildings that must be built soon were to be located separately in various parts of the community, the city would undoubtedly have to pay what in the aggregate would total fully as much as this centrally located combined site would cost.

The designs of the City Hall, postoffice and the memorial forecourt, shown on the perspective insert, are intended merely as suggestions of their relative mass and location. It is sincerely to be hoped that these structures may be designed by the most competent architects and that the City Plan Commission or an Art Commission will see that each new structure, as built, harmonizes with its neighbors and takes its proper place in the general plan.

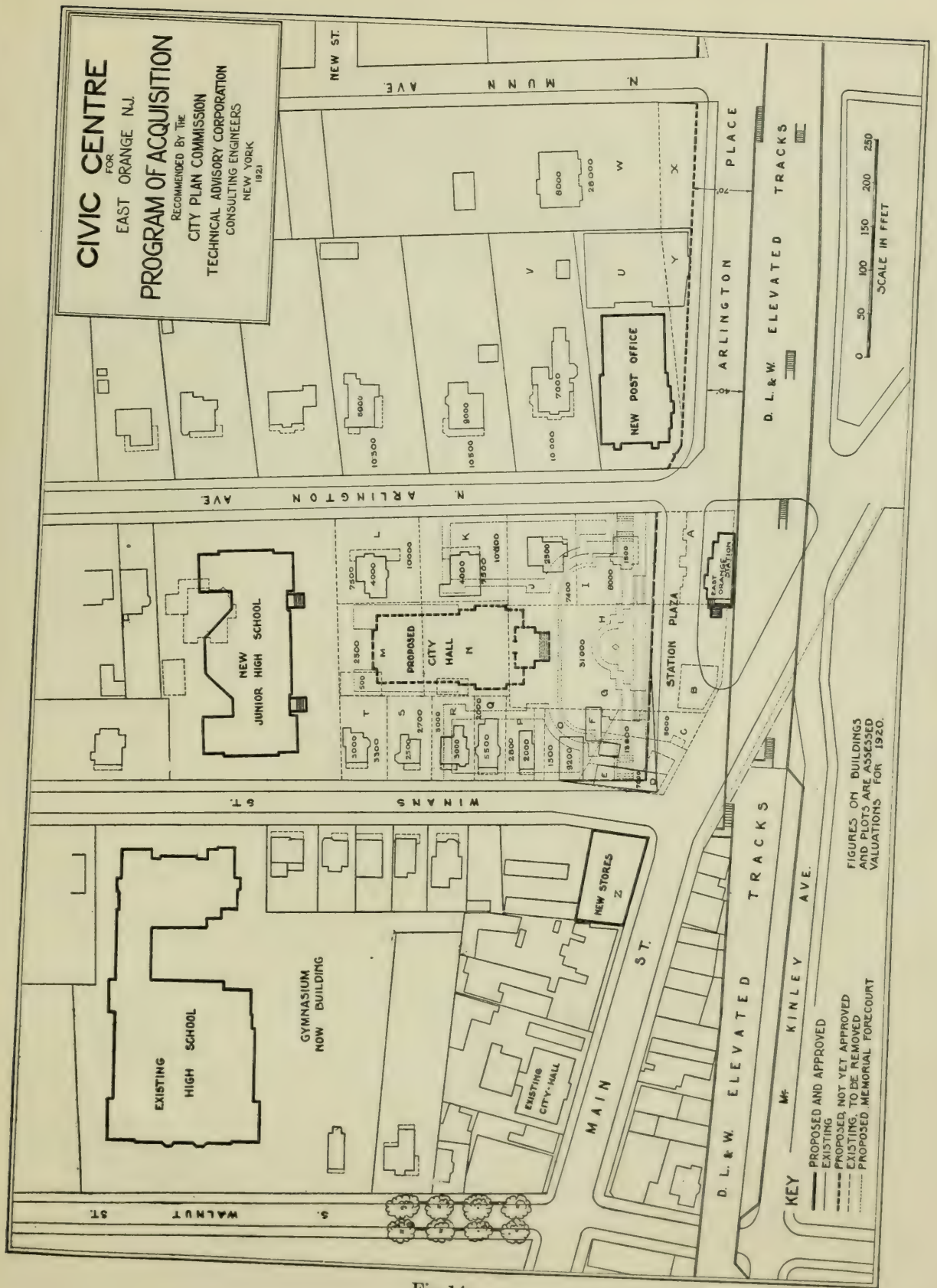


Fig 14.

X.

BUILDING ZONE ORDINANCE AND BUILDING CODE

STARTING about 1910, many apartment houses were erected in East Orange. One fine residential block after another was invaded by these structures, four or more stories high, built close to the street line and the side lot lines and depriving their neighbors of light and air and outlook. Property values were halved and the privacy and healthfulness of home life were impaired.

At about the same time, large, noisy, dirty, and evil-smelling public garages, with their repair shops and service stations, began to spring up in the best business sections and even back in the residential districts. New factories and shops located wherever they pleased, sometimes on good residence streets.

On May 16, 1920, with Mr. Wilbur S. Johnson as chairman, and Mr. Hobart A. Walker as secretary, there was constituted a Commission on Building Districts and Restrictions, consisting of eleven members, four of whom were, by statute, members of the City Plan Commission. These four were Messrs. John W. Coulston, Richard K. Mosley, Charles A. Heiss and Robert M. Crater.

On July 13, 1920, the East Orange Commission on Building Districts and Restrictions received from the City Plan Commission an appropriation for the preparation of a zoning ordinance and maps, and the Technical Advisory Corporation of New York was retained to act as consulting engineers. It was hoped, through such an ordinance, to stop further undesirable intrusions and resulting depreciation. The engineers made a field study of every lot of ground and every building or structure in the city with a view to securing the exact facts essential to the preparation of an adequate and reasonable zoning ordinance. Among other things, there were determined:

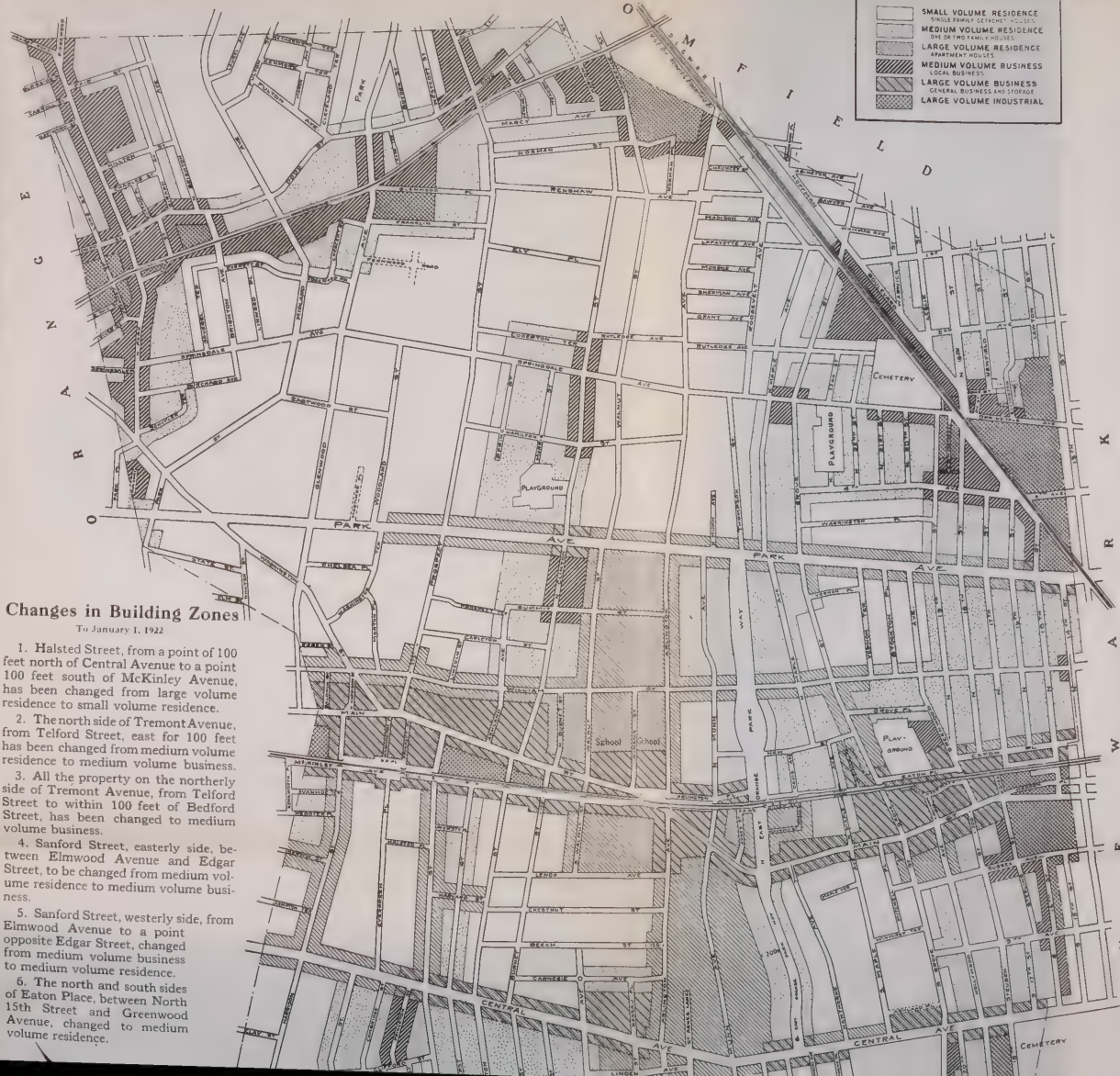
1. The number of families in each house
2. The construction of each building
3. The height of each building
4. The exact use of each building or premises or part thereof
5. The setback of each building from the street line
6. The width of each side yard
7. The depth of the rear yard
8. The location and height of each rear yard structure
9. The unit property value of each block front
10. The locations of unimproved lots or parts of lots

In addition, all existing zoning ordinances and all drafts of ordinances then proposed throughout the United States were examined in detail to see what they might contain which would be of interest or value to East Orange. A study was also made of the actual operation and practice under zoning ordinances already in effect, so that East Orange might profit by practical experience obtained in other cities.

The courts have ruled that a zoning ordinance must be reasonable and that it must work no unnecessary hardship on the individual property owner, subject to the greatest good to the greatest number. In this connection the United States Supreme Court has found in various decisions that cases of individual injury do not necessarily stop a city from legislating in the general interest.

The greatest care was taken throughout the preparation of the zoning ordinance and maps in East Orange to reduce the cases of hardship to an absolute minimum.

Studies for a thoroughfare and street system and for track elevation were being carried on at the same time as those for the zoning ordinance so that there was a constant and profitable interplay between them. The zoning ordinance has been closely linked up with the rest of the City Plan. It does not petrify or freeze the city in its existing state, but creatively plans ahead and directs the development of private property along orderly lines.



Changes in Building Zones

To January 1, 1922

1. Halsted Street, from a point of 100 feet north of Central Avenue to a point 100 feet south of McKinley Avenue, has been changed from large volume residence to small volume residence.

2. The north side of Tremont Avenue, from Telford Street, east for 100 feet has been changed from medium volume residence to medium volume business.

3. All the property on the northerly side of Tremont Avenue, from Telford Street to within 100 feet of Bedford Street, has been changed to medium volume business.

4. Sanford Street, easterly side, between Elmwood Avenue and Edgar Street, to be changed from medium volume residence to medium volume business.

5. Sanford Street, westerly side, from Elmwood Avenue to a point opposite Edgar Street, changed from medium volume business to medium volume residence.

6. The north and south sides of Eaton Place, between North 15th Street and Greenwood Avenue, changed to medium volume residence.

Changes in Building Zones

To January 1, 1922

1. Halsted Street, from a point of 100 feet north of Central Avenue to a point 100 feet south of McKinley Avenue, has been changed from large volume residence to small volume residence.

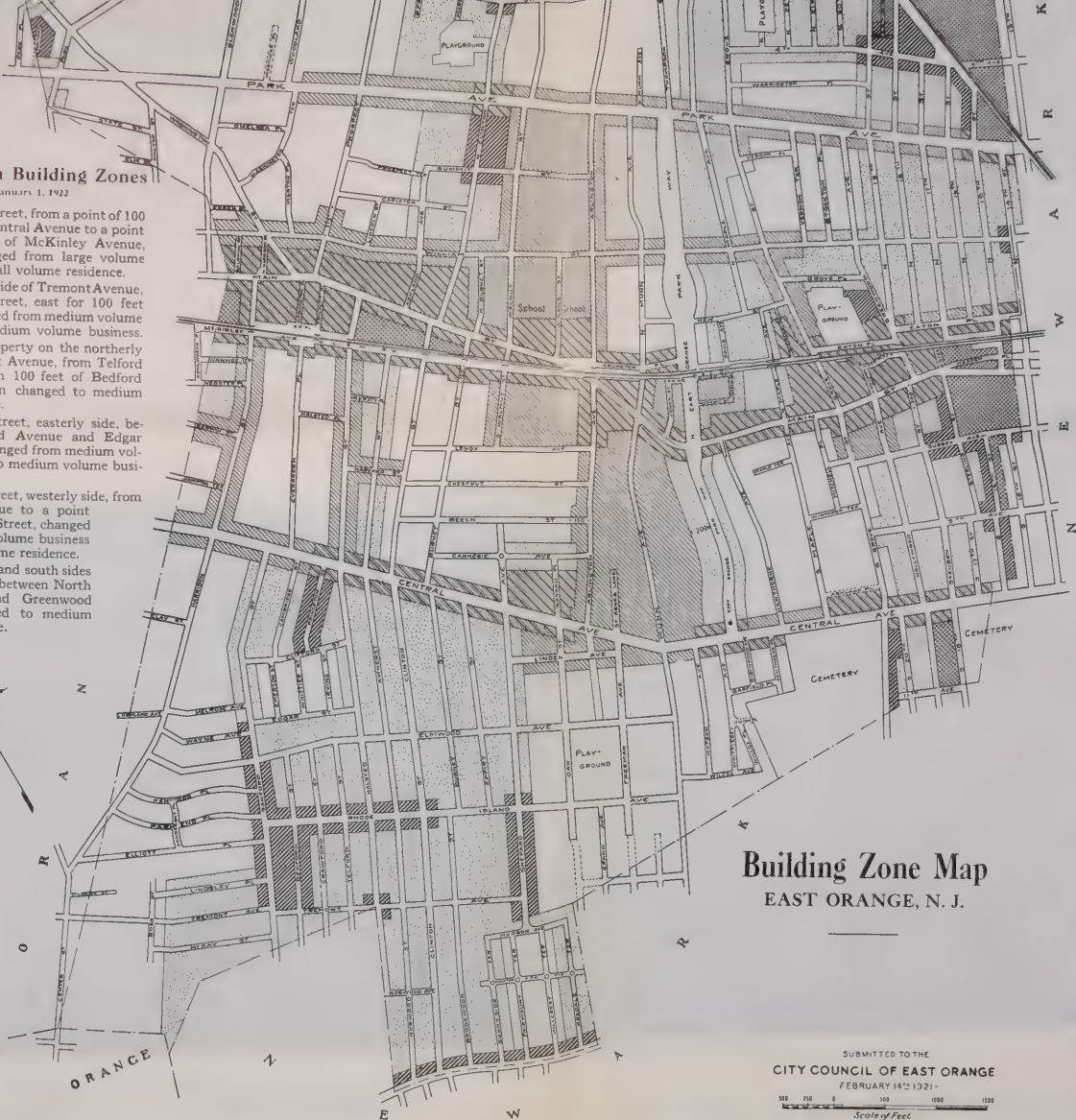
2. The north side of Tremont Avenue, from Telford Street, east for 100 feet has been changed from medium volume residence to medium volume business.

3. All the property on the northerly side of Tremont Avenue, from Telford Street to within 100 feet of Bedford Street, has been changed to medium volume business.

4. Sanford Street, easterly side, between Elmwood Avenue and Edgar Street, to be changed from medium volume residence to medium volume business.

5. Sanford Street, westerly side, from Elmwood Avenue to a point opposite Edgar Street, changed from medium volume business to medium volume residence.

6. The north and south sides of Eaton Place, between North 15th Street and Greenwood Avenue, changed to medium volume residence.



Building Zone Map EAST ORANGE, N. J.

SUBMITTED TO THE
CITY COUNCIL OF EAST ORANGE
FEBRUARY 14TH 1921 -

Scale of Feet
500 750 0 100 1000 1500

Fig. 15

In the fall of 1920, the first draft of the ordinance was submitted to the Commission by its engineers. The Commission held numerous meetings and made many visits of inspection in the field, in order to refine the ordinance and maps to the point where all could agree that they represented the best possible kind of zoning for East Orange. On November 12, 1920, the Commission on Building Districts and Restrictions published the text of the proposed zoning ordinance, with full annotations. An attempt was made to eliminate all unnecessary features, but it was nevertheless thought desirable to take care of most of the exceptional conditions that would be likely to arise, so as to leave as little as possible to the discretion of the Board of Appeals.

The City of East Orange was the first city in the country to have one zoning map instead of three or four separate maps for height, area, use and setbacks respectively. All other zoned cities had had from eleven to twenty-three different kinds of districts, while East Orange has only six types of coterminous districts. This leads to distinct advantages in the administration and popular comprehension of the ordinance.

The policy was adopted of correlating the zoning ordinance with the revised building code, so that everything that had to do with the use of buildings, their layout and their location on the lot, was covered in the zoning ordinance, while everything that had to do with the construction of buildings and their interior planning and sanitation was to be concentrated in a revised building code. It is the intention to publish these two ordinances eventually in one volume with a common index.

Two thousand copies of the tentative zoning ordinance were distributed throughout the city and then the Commission held a series of public hearings, one for each of the five wards. A number of pertinent constructive suggestions were made at these hearings. The preponderating sentiment, however, was to stiffen the regulations, rather than to relax them; in other words, the citizens wanted just as much protection as they could possibly get.

A series of meetings was held with the Real Estate Board of the Oranges, whose members, from their daily experience, were able to suggest a number of improvements. Other private conferences were also held. Finally, all suggestions and criticisms were studied by the Commission and a number of improvements made in the ordinance and map. In January, 1921, the City Council proceeded with public hearings which elicited further constructive suggestions.

The ordinance went into effect on March 16, 1921. Since that date many more building permits have been requested than during an equal period previously. The protection afforded by the ordinance is the reason given by property owners for this activity and real estate dealers state that the fact that East Orange is zoned is always an asset.

XI.

FUTURE POPULATION AND REAL ESTATE VALUES

FUTURE POPULATION

THERE is a general biometric theory which is believed to underlie the growth of population in any community, particularly if large in size. No country, no large city, and only an occasional small one, for a restricted period, approximates a straight line rate of growth. The general law includes such effects as proceed from wars and pestilence, and includes the operation of such factors as hard times and the restriction of immigration. It applies to cities as well as to nations, especially to the older or larger cities.

The general type of curve representing population growth developed from this theory is of a somewhat distorted "S" shape. This means that in the earlier years of the development of a community the rate of growth is slow. Later, the rate of increase (not the increase itself) becomes greater and greater, until it reaches a maximum; after which it progressively decreases. Eventually it retards more and more until the population becomes practically constant at what may be called the point of saturation.

The following table gives the population of East Orange as disclosed by the Federal and State censuses, by semi-decades:

POPULATION OF EAST ORANGE

1865.....	3,206
1870.....	4,315
1875.....	6,497
1880.....	8,349
1885.....	10,328
1890.....	13,282
1895.....	17,927
1900.....	21,506
1905.....	25,175
1910.....	34,371
1915.....	40,961
1920.....	50,587

The information derived from this table was carefully examined by graphical and analytical methods. The annexed diagram (Fig. 16) shows the past population by small circles. The smooth "S" shaped curve, drawn so as to conform as nearly as possible, to the population data of the past, increases more and more in its slope with the passage of the years, up to 1915. The *rate of increase* began to diminish about that year. Application of the theory indicates that an *actual change* of direction of curvature will begin about the year 1930. After that date, the rate of increase promises to diminish so as to form the upper section of the "S" curve. Based on this conjecture, it is estimated that the future populations of East Orange will be in accordance with the following table:

FUTURE POPULATION OF EAST ORANGE

Year	Unrestricted Growth	Modified by Zoning
1930.....	71,000	70,000
1940.....	90,000	88,000
1950.....	105,000	102,000
1960.....	116,000	111,500
1970.....	122,500	117,500
1980.....	127,500	121,000
1990.....	130,500	123,500
2000.....	132,500	124,500
2010.....	133,500	125,000
2020.....	135,000	125,000

In order to secure a check on the figures for unrestricted growth, studies were made of the distribution of population by enumeration districts. The population of each district was plotted on a map. An examination was then made of each block in the city to ascertain how many more residences might be erected, if of the same type and same general distribution as those in existence in the year 1920. This indicated an ultimate population of 69,877. But the average character of residence occupancy in East Orange is changing and is sure to change more in the future. A block-by-block estimate was accordingly made of the number of persons who could legally be housed under the zoning ordinance as it was passed. The additional increment disclosed was 55,060. The estimated total population which might ultimately be possible in East Orange was thus computed at 124,937. This is only 10,000 less than the probable population determined on the basis of the "S" curve. It is therefore at once a check upon the accuracy of the theory and an indication of a benefit which will accrue to the city from the zoning ordinance.

While making the studies described, the population increases, block by block, were shown on the population spot map. This map may be employed by the city authorities in determining probable future needs with respect to water supply, the sewer system, parks and playgrounds, schools, street car and bus lines, business centers, street traffic and a paving program, together with other factors of a non-municipal nature, such as the supply of gas, telephones and other services.

If it is objected that the chart undertakes to make definite estimates where exact figures are impossible, the reply is that every expenditure for municipal facilities involves an estimate of this sort, if such expenditure is to be intelligently made. The present estimate is believed to be the most nearly correct that is possible at the moment, and to be of such accuracy as to warrant a consistent and coordinated plan for improvements; a plan so adjusted as to avoid the provision of excess facilities of one kind or a shortage of necessary facilities of another kind.

REAL ESTATE VALUES

An analysis was made of the relationship between population and total valuation of real property in all cities of the United States having more than 50,000 and less than 125,000 inhabitants. This showed that wide variations exist in the total valuations of cities of the same size and that correspondingly wide ranges of population are found in cities with approximately the same real estate valuation. East Orange at present stands relatively high in real estate value among cities of its size. When the population of East Orange shall have increased to 125,000, the total tax valuation (based on the most unfavorable rate discovered) will be at least \$75,000,000, an increase of only 50 per cent over the present figure. This value is about \$20,000,000 less than the present valuation of Paterson, with a population of 135,000.

If East Orange maintains her present relatively high rank, her tax valuations will run as high as \$175,000,000. This valuation is equal to that of Springfield, Mass., with a present population of 130,000, and is only about \$20,000,000 in excess of the present valuation of Yonkers, which has a population of 100,000. It is hardly to be expected that values in East Orange will stop at the minimum of the figures above suggested; and it may be assumed on the side of conservatism that she will not reach the maximum. Judging from the somewhat meager data available, the best founded assumption is that when East Orange attains a population of 125,000, she will probably exhibit the same proportionate real estate values as she does today with 50,000 population. The present day valuation is approximately \$50,000,000; hence the eventual valuation will probably reach \$125,000,000, and follow the same proportion as increases in population.

These estimated future valuations by decades will make possible the preparation and close following of a program or budget of public improvements.

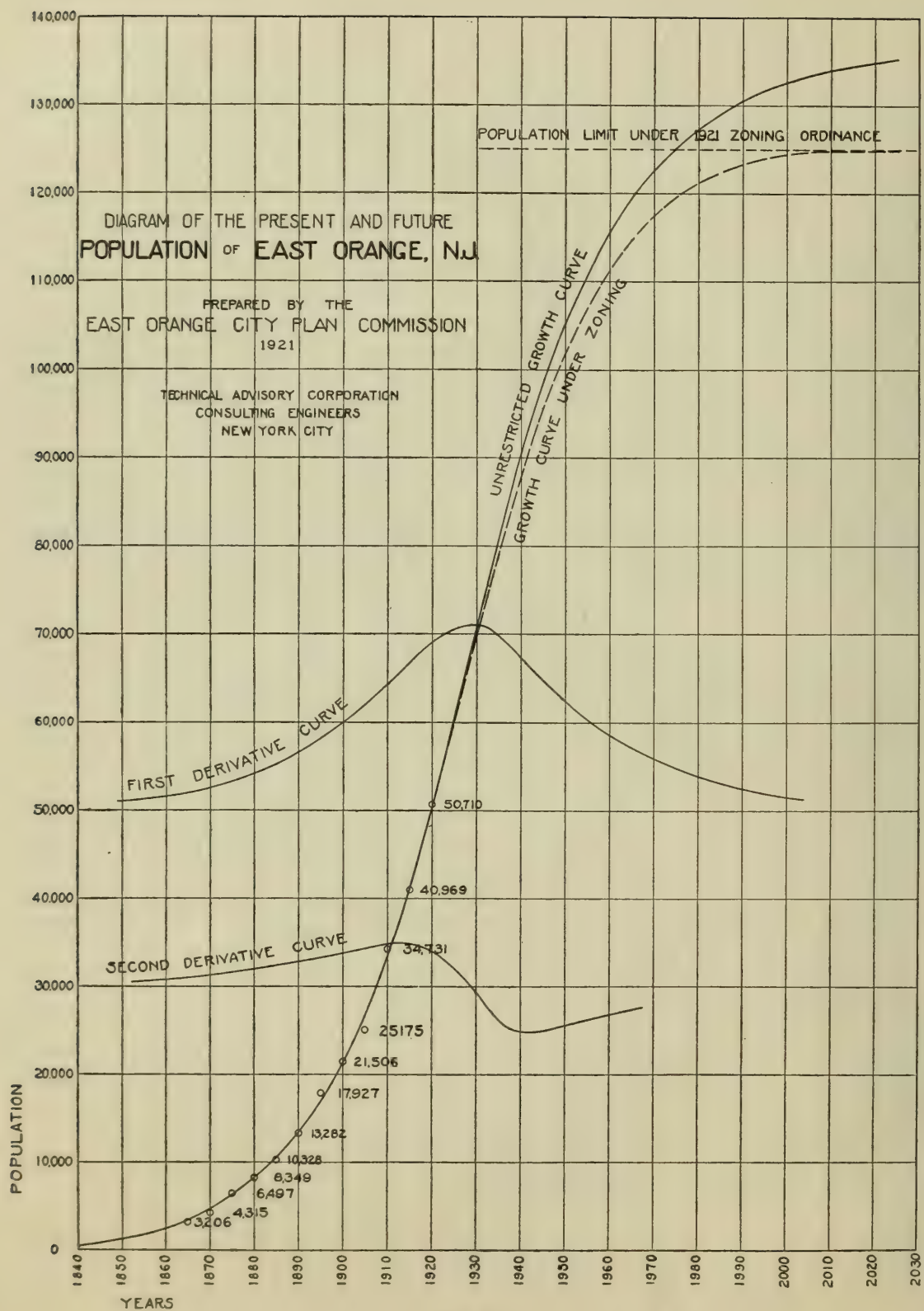


Fig. 17

XII.

FINANCING

PAYING FOR PUBLIC IMPROVEMENTS

IF CITY PLANNING is to be effective it must be followed by City Building. City Building includes both new construction and the reconstruction of existing public works where necessary.

City Building involves money expenditure. The costs must be met from some source. The ultimate beneficiary of every legitimate public improvement is the general public, more particularly the public included within the citizenship of the community undertaking the improvement. In many instances, the benefits extend to a public outside the particular community which makes the improvement. The construction of a bridge which is opened for free use is an example. Those outside the adjacent zone provide in their turn other bridges which benefit the owners who built the bridge first. The final result is equitable if the development of the whole region is fairly uniform.

Logically, the person who is benefited should pay in proportion to the benefit derived. That is the theory of all barter and sale. It was the reason for toll roads and toll bridges. But many persons besides actual users of an improvement are benefited by it. The construction of a new bridge increases the number of travelers. Such travelers require food and other things. Property near the bridge produces an increased return if used to cater to the traveling public. Furthermore, the bridge exists as a potential and usually cumulative benefit for generations to come.

The difficulties incident to the exact analysis and quantitative determination of the different elements of value have no doubt largely dictated the common methods used for securing funds to pay for public improvements. When a single large piece of public work is undertaken, the problem is complicated. If the cost of such a large piece of work is included in a single year with the administrative taxes (as is often done with small improvements), the tax levy is heavily increased, and the burden falls largely on real estate owners. A large public improvement usually has a long life, and its benefits are enjoyed (often in increasing ratio), over a long period of years. This leads to the use of bonds as a device for raising large sums of money. The repayment of the bonds can be definitely postponed or distributed over an extended period. Bonds should be employed only under very definitely limited conditions:

(a) Some satisfactory provision should be made for their retirement other than through refunding, *e.g.*, by sinking fund or serial payments of some one of several varieties.

(b) Those called upon to provide the sinking fund or to meet the serial payments should be the ones benefited. It is not equitable to finance a part of a sewer system by a bond issue to be repaid from general taxation if the system can be of benefit to only a small extent outside the area served, unless all other parts of the community have been or are to be similarly financed. The fact that an original financing has been general is no reason why a similar procedure should be followed for the reconstruction of the old improvement.

(c) The life of a bond issue should never be as long as the life of the improvement for which it pays.

With respect to sinking fund vs. serial bonds, many considerations point toward the latter method of financing as the superior one. A sinking fund, even though intended to be of ample size, may be mishandled or the sources may fail or even become over-productive. The annual payments for retiring serial bonds may be arranged in many different ways. Equal values of bonds may be retired annually, and decreasing interest payments made on the balance outstanding. This is often an ideal method for retiring paving bonds, because the reducing interest payments are fairly well balanced by increasing maintenance costs. Equal annual payments may be contemplated with a varying annual distribution of amount as between interest and principal, or the retirement of bonds may start after the lapse of a certain period. In the case of a new school building in a sparsely built up district, it is often desirable that the community should pay interest on the entire investment for

from two to five years, until the district becomes more densely settled and the city rendered better able to bear the expense of retiring bonds. Thereafter the equal annual payment method might be used, or even an accelerated payment scheme. East Orange is in an advantageous financial position in this regard as her bonded indebtedness is almost entirely of the serial variety.

The tendency is too common for cities to issue bonds for every improvement. This places a burden on future generations. Many of the improvements now enjoyed in a community have entailed no part of the initial expense upon the taxpayers of the present day. Such is the case with practically all streets and some sewers. They were provided by our predecessors. To finance all present day public improvements by bonds will not postpone the burden so as to relieve the individuals of the present generation. The average age of the urban population of New Jersey is thirty years. According to mortality experience tables, the probable age to which the average person will live is sixty-five. Bonds issued today in accordance with any approved banking practice will have to be paid off within the lifetime of the average person now living. Postponing the date of payment leaves the obligation still to be paid by ourselves.

The average taxpayer has most of his savings (if he has any) in a savings bank at three or four per cent interest. The same taxpayer is paying five to six per cent on his share of the community's bonded indebtedness. Were he to invest the proper proportion of his savings in municipal or state bonds, he would save forty or fifty per cent of what he now pays in taxes in order to meet the interest on bonds, the principal of which he must ultimately also pay. Few taxpayers can invest their money so as to derive a greater return than the rate paid on municipal bonds. Wealthy citizens whose capital is actively employed can afford and will prefer to borrow on the basis of the credit of the community for meeting their share of community financing rather than to borrow on their own credit. The latter course curtails their total credit and impairs their power to derive higher rates of return. Hence the wealthy man prefers that the community borrow to pay for its improvements, while the poor man's true interest is favored by the opposite course. It is highly desirable that citizens of modest means be induced to purchase municipal and state bonds of small denomination direct from the city or state.

Where the benefit from a public improvement is largely local, the cost should be apportioned by some device which will give it local incidence. A sidewalk in a purely residential district is an example of such an improvement. The practice of levying local assessments for such work in proportion to benefit received, is logical and proper, and should be employed wherever it can possibly be applied without increasing the cost of tax collection and wherever the distribution of benefit is unequal. In the application of this method, one or more zones of varying area should often be designated, each with its specific rate of assessment.

Very often the improvement causes an incidental special beneficial result entirely aside from its general benefit. For example, Elmwood Park has been the apparent cause of rapid and large appreciation in values of adjoining real estate. The city reaps a benefit from the increased tax return, but this benefit seems entirely too small, because the community at large is really producing the increase of value by which private owners profit.

Had the City of East Orange purchased all property fronting on the opposite side of all the streets surrounding the park, and sold it at only half the increase of value that has been privately realized, almost the whole cost of construction of the park would have been met. The city could not do this because it lacks the power of excess condemnation.

The aggregate cost of the public improvements which have been considered by the City Plan Commission is so large that a public improvement budget was formulated. The present net bonded indebtedness was analyzed and the future net burden on the community (outstanding bonds less sinking fund accretions from year to year) was computed. On the basis of the future population curve, the history of tax valuations in East Orange during previous decades, and of similar statistics with reference to other cities in the country similar in character to East Orange, a curve of probable future tax valuations was drawn. From this information curves were prepared representing 6 per cent and 7 per cent, respectively, of such estimated probable future tax valuations. Seven per cent

is the present legal limit of bonded indebtedness permitted in East Orange. The 6 per cent curve was drawn to indicate what may be considered its conservative bonding power.

A curve was next prepared showing the estimated cost of recommended improvements year by year. Assuming that bonds are to be issued to cover the costs of the suggested improvements, and that they would be either of the sinking fund or the serial type, each issue would decrease in net bond obligation on the community progressively to its date of payment. It was also assumed that each issue of bonds would have a total life of forty years, and a curve was constructed showing the aggregate bond burden in future years like the one for the bonds outstanding in 1922.

A comparison of this last curve with that showing the maximum bonded indebtedness which it is estimated the city may legally have on the basis of a given percentage of its estimated tonnage tax valuation, shows that about the year 1928 the net bonded indebtedness would exceed 6 per cent of the estimated tax valuation. About 1930 it would similarly pass the 7 per cent limit. If bonds were issued, irrespective of this legal limit, the curve would recross the 7 per cent limit about the year 1938 and fall below the 6 per cent ratio about the year 1945.

The small hatched area above the 7 per cent line indicates roughly what portion of the indebtedness would have to be financed by assessments for benefit, direct taxation or other method. The actual total which must thus be treated is larger than that indicated by the hatched area because of the method used in reducing the assumed bond burden through sinking fund accretions or retirement of serial bonds.

By employing other methods of financing aside from issuance of bonds, it is believed possible to keep the net burden below a 6 per cent assumed limit without hardship.

These studies show that the city should be amply able to finance all of the contemplated public improvements considered by the City Plan Commission without undue financial burden.

ESTIMATED COST OF IMPROVEMENTS RECOMMENDED FOR CONSIDERATION
AT STATED INTERVALS FROM 1922 TO 1972

WITHIN FIVE YEARS		TWENTY TO TWENTY-FIVE YEARS	
Street System.....	\$940,000	Street System.....	\$830,000
Parks and Parkways.....	70,000	Parks and Parkways.....	70,000
Schools and Playgrounds.....	2,400,000	Schools and Playgrounds.....	1,000
		Sanitary Sewers.....	430,000
Total.....	\$3,410,000	Total.....	\$1,331,000
FIVE TO TEN YEARS		TWENTY-FIVE TO THIRTY YEARS	
Street System.....	\$740,000	Street System.....	\$930,000
Parks and Parkways.....	70,000	Parks and Parkways.....	70,000
Schools and Playgrounds.....	1,010,000	Schools and Playgrounds.....	35,000
Sanitary Sewers.....	430,000		
Storm Sewers.....	1,320,000		
Total.....	\$3,570,000	Total.....	\$1,035,000
TEN TO FIFTEEN YEARS		THIRTY TO THIRTY-FIVE YEARS	
Street System.....	\$618,000	Street System.....	\$360,000
Parks and Parkways.....	70,000		
Schools and Playgrounds.....	1,190,000		
Total.....	\$1,878,000		
FIFTEEN TO TWENTY YEARS		THIRTY-FIVE TO FORTY YEARS	
Street System.....	\$720,000	Street System.....	\$200,000
Parks and Parkways.....	70,000		
Schools and Playgrounds.....	50,000		
Total.....	\$840,000	FORTY TO FIFTY YEARS	
		Street System.....	\$200,000

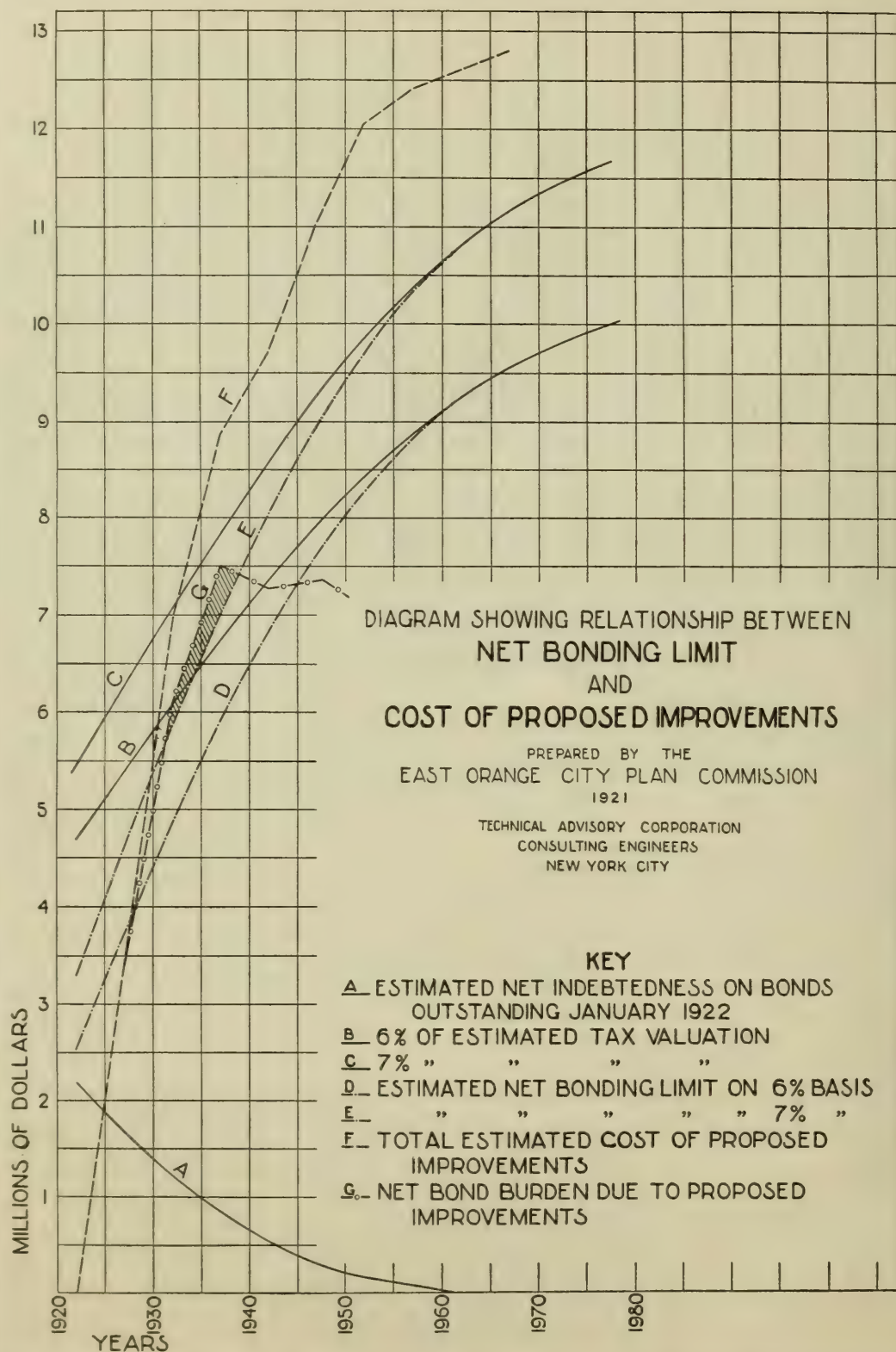


Fig. 18

XIII.

LEGAL SITUATION

THE City Plan Commission of East Orange was created, and at first operated, under Chapter 170 of the Laws of 1913, which authorizes mayors or boards of commissioners in second-class cities to appoint commissions of nine citizens, each to hold office for one year, and to serve without pay. An appropriation of \$5,000 per year is authorized for the use of any such commission.

The law above mentioned was superseded by Chapter 218 of the Laws of 1921 which fixes the number of members of city planning commissions at seven, to be appointed for three-year terms, the chairman to be designated by the mayor. The duties are laid down rather elaborately as follows:

Section 2. Such city plan commission shall prepare plans and maps for the systematic future development and betterment of such city. It may make changes in such plans and maps when it deems such changes advisable. Such plans and maps may show any and all matters and things relative to the expansion and growth of the city, the promotion of its economic and industrial prosperity and the enhancement of the health, comfort and convenience of its people as such city plan commission may determine. Such commission may, moreover, study and in its discretion recommend ways and means which will tend to prevent or relieve congestion, either of population or of traffic, to control the fire hazard, to coordinate or improve transportation facilities, to preserve the natural and historic features of the city, and to beautify the city. Such commission may also prepare and issue reports on the best method of financing and assessing the cost of public improvements. Such commission may investigate, prepare surveys of and make recommendations on any matter which will in its opinion make the community either a better place to live in or a better place to work in. Plans may be made by such commission for new streets, roads, boulevards, alleys, way, viaducts, bridges, subways, parkways, parks, playgrounds, aviation grounds, rail and water terminals, docks, wharves, canals, basins, tunnels, markets, waterfront improvements, public utilities, public buildings and all other public improvements. Where any of the foregoing shall exist, then the city plan commission may make recommendations as to either their removal, relocation, widening or extension.

Cities of the second-class in New Jersey are at a disadvantage. Chapter 72 of the Laws of 1913 requires in a first-class city (Newark) that questions concerning location and design of artistic public works and plats or replats of lands shall be submitted to the City Plan Commission before final action is taken. The former extension of function of City Plan Commissions is also by Chapter 188, Laws of 1915, made possible in third-class cities and smaller municipalities. City Plan Commissions may be created in such communities by a referendum vote. Cities of the second-class have not been given these powers.

Control over the platting of sub-divisions should be given City Plan Commissions in second-class cities, but control over municipal art would better be assigned to an art commission or jury as in Pennsylvania (Acts 1913, No. 456) where no structure for which funds or a site are provided out of the city treasury shall be begun until the art jury has approved the design and location.

Control of plats in New York State may by ordinance be assigned to a planning commission under the provisions of the general municipal law of 1913, Chapter 699, Article 12-a, Section 238. A year previous, provision was made for control of plats in Pennsylvania (P. L. 1912, Pp. 436 and 437 as amended by P. L. 1913, P. 119, Sections 2, 3 and 4) by requiring municipal approval of plotted streets before filing with the county clerk. The Pennsylvania law of 1913, No. 406, goes further and controls plotting three miles outside of the city limits, authorizing the city to refuse sewer, water and gas connections until the plat has been approved.

County plan commissions were made possible in New Jersey by Chapter 185, Laws of 1918. This authorized boards of chosen freeholders to plan for betterment and systematic development, especially in the laying out of roads and boulevards, through the agency of a county planning com-

mission consisting of seven citizens, and furnished with such sums of money as might be appropriated.

It is generally agreed that one of the outstanding needs in city planning is a general and complete street plan, officially adopted, so that any property owner may know exactly where future streets are likely to cross his tract. The Pennsylvania Act of May 13, 1891, Section 12, P. L. 79, prescribes that every municipality shall have such a general plan. The provision of this act that no person may recover damages for buildings when streets are opened where such buildings have been located within the lines of such street subsequent to its plotting, has been declared constitutional.

In New Jersey, Chapter 152, Laws of 1917, Article XXII., 1 (h), authorized municipalities to make a city map. They may

“cause the territory within the municipality to be accurately surveyed and a map prepared, showing the location and width of each street, avenue, highway, lane, alley and public place, and a plan prepared for the systematic opening of roads and streets in the future; such map may be amended and changed from time to time.”

The enactment does not take cognizance of the problem of buildings erected within the lines of future streets. It has been suggested that the plotting of future streets should expire by limitation after a lapse of a given number of years if expropriation does not take place, and that meantime buildings erected within the street lines would not be paid for when the street was acquired. It has also been suggested that a Board of Appeals be created by law which should have power in specific cases to grant permits for structures on plotted streets, if the land through which the street has not yet been opened can be demonstrated not to yield a fair return to its owner in connection with his adjacent holdings.

The practice of local assessment for benefit is expressly authorized by Chapter 152, Laws of 1917, Article 20, Section 5.

The statute provides that two-thirds of the owners proposed to be assessed may stop an improvement. It also provides for a division of cost as between the municipality and those locally benefited and provides for estimates of benefits concurrently with those of damage. There are ten listed types of public improvement which may thus be conducted on the basis of local assessment, but these types do not include such improvements as playgrounds and public buildings. An amendment should be sought to include them and others.

The Essex County Park Commission has not been granted the right to assess benefits locally. Under Chapter 252 of the Laws of 1916 as amended by Chapter 70 of the Laws of 1921, the total amount of bonds which may be issued for county park purposes in any one year is prescribed.

The principle of excess condemnation has not yet been recognized in New Jersey, and an effort to introduce it by constitutional amendment failed. Since the necessary five years have elapsed, further efforts should be made to secure a constitutional amendment permitting excess condemnation. The constitution of the Commonwealth of Massachusetts, Article 10, Part 1, amended November, 1911, permits the legislature to condemn excess land for highways or streets sufficient for suitable building lots on both sides, and to sell the surplus after completion of the improvement. The amendment to the constitution of Wisconsin, Article 11, adopted November 4, 1912, permits excess condemnation for public works, and permits future sale under covenant restrictions. Both ideas should be included in any New Jersey amendment.

Playground commissions now operate under the revised playground law of 1911, Chapter 308, which grants the power to acquire lands for playgrounds and to equip such grounds by the erection of buildings and apparatus. Chapter 244 of the Laws of 1921 is a recent amendment to the playground law, authorizing the creation of joint and county recreation commissions.

Chapter 152 of the Laws of 1917, Article 14, gives municipalities the power to regulate building construction (Section N), to establish fire limits (Sections O, P), and to demolish buildings (Section Q), A municipality may also control fences (Section ee) and encroachments over public highways ((Article 15, sub-section e).

Building zones or restrictions are authorized by Chapter 156 of the Laws of 1918; Chapter 240, Laws of 1920; and Chapter 82, Laws of 1921. It is exceedingly desirable that the next legislature codify and amend these laws. In particular, there should be such a definition of the powers of the board of appeals as exists in New York State under chapter 483 of the Laws of 1917 as modified by Amendments 81-84 to the Laws of 1920:

“Such Board of Appeals shall hear and decide appeals from and review any order, requirement, decision or determination made by an administrative official charged with the enforcement of any ordinance adopted pursuant to paragraphs 24 and 25 of section 20 of this Act. They shall hear and decide all matters referred to them or upon which they are required to pass under any ordinance of the Common Council adopted pursuant to such two paragraphs.

(4) “The Board of Appeals may reverse or affirm wholly or partly, or may modify the order, requirement, decision or determination appealed from, and shall make such order, requirement, decision or determination as, in its opinion, ought to be made in the premises and to that end it shall have all the powers of the officer from whom the appeal is taken. Where there are practical difficulties or unnecessary hardships in the way of carrying out the strict letter of such ordinance, the Board of Appeals shall have power, in passing upon appeals, to vary or modify any of its rules, regulations or provisions relating to the construction, structural changes in equipment or alteration of buildings or structures so that the spirit of the ordinance shall be observed, public safety secured and substantial justice done.”

In addition to this improvement, specific amendments to the New Jersey statutes should authorize setback building lines, one-family house districts, control of interior lighting and ventilation and other matters.

The New Jersey Tenement House Act was adopted as Chapter 61 of the Laws of 1904 and was amended March 31, 1905, April 19, 1906, May 1, 1911 and March 5, 1918. While the law follows current practice throughout the country, it was intended primarily to mitigate the worst conditions in the largest cities of the state, and its standards are regrettably low.

The New Jersey Labor Laws, the Lighting Act of the Department of Labor, the Sanitary and Engineering Industrial Standards of the Department of Labor and its general rules covering the details of various equipment deal adequately with many questions related to safety and health in industrial and commercial buildings. The school building code, dated May 1, 1915, of the State Board of Education deals with problems of safety and health in the construction of school buildings.

The following five legal corrections or amplifications are those most needed in connection with city planning in New Jersey:

1. Amendments to the city planning law
2. Amendment and codification of the zoning law
3. Amendment of the statutes governing cities to permit local assessment for play-ground development
4. A law permitting control of the erection of buildings in mapped streets
5. A constitutional amendment permitting excess condemnation

XIV.

SPECIAL METHODS EMPLOYED

IN WORKING out the East Orange City Plan the consulting engineers went beyond the mere adaptation of their experience in other cities for the use and benefit of the City Plan Commission and actually developed a number of methods which have been described only in a very brief way in the body of this report. The novelty of these methods for the most part lies in their application. Many of the methods themselves are not particularly new to engineers, but they are new in city planning. They apply to the collection, analysis and presentation of data and to the actual solutions of city planning problems. The preliminary outline for the city plan contained fifty-seven items. Each one of these was considered with respect to—

- (a) Existing conditions
- (b) Tendencies and provision necessary for the future
- (c) Relative standing of the community
- (d) The specific problem
- (e) Previously suggested solutions for such problem
- (f) The best solution and how to apply it

In connection with their order of urgency, the various elements of the city plan were grouped in three classes:

1. Those with respect to which existing facilities were adequate both for the present and for the future
2. Those with respect to which existing facilities were adequate for the present but not for the future
3. Those with respect to which existing facilities were inadequate

A further sub-division was made of the items in Class 3 in order of necessary action.

The report with its Appendix illustrates, though briefly, the outcome of the methods referred to. There have been established therein certain basic data and starting points.

The future growth of population has been forecasted. A method has been developed for determining the desirable size of any public improvement in its relation to the future growth of the city. The best location for the Civic Center has been determined and a practicable method of paying for the site has been described in detail. It has been shown that necessary new parks, parkways and thoroughfares can be made to pay for themselves; and that the city can actually save money by adopting more modern methods for refuse disposal. A general program has been laid down for sewer expansion.

A zoning ordinance is in effect which is immensely simpler than any of those which had preceded it. In a very real sense city planning in East Orange has been constructive and creative.

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East Orange, N.J. City plan
commission
City plan for East Orange,
Essex county, New Jersey

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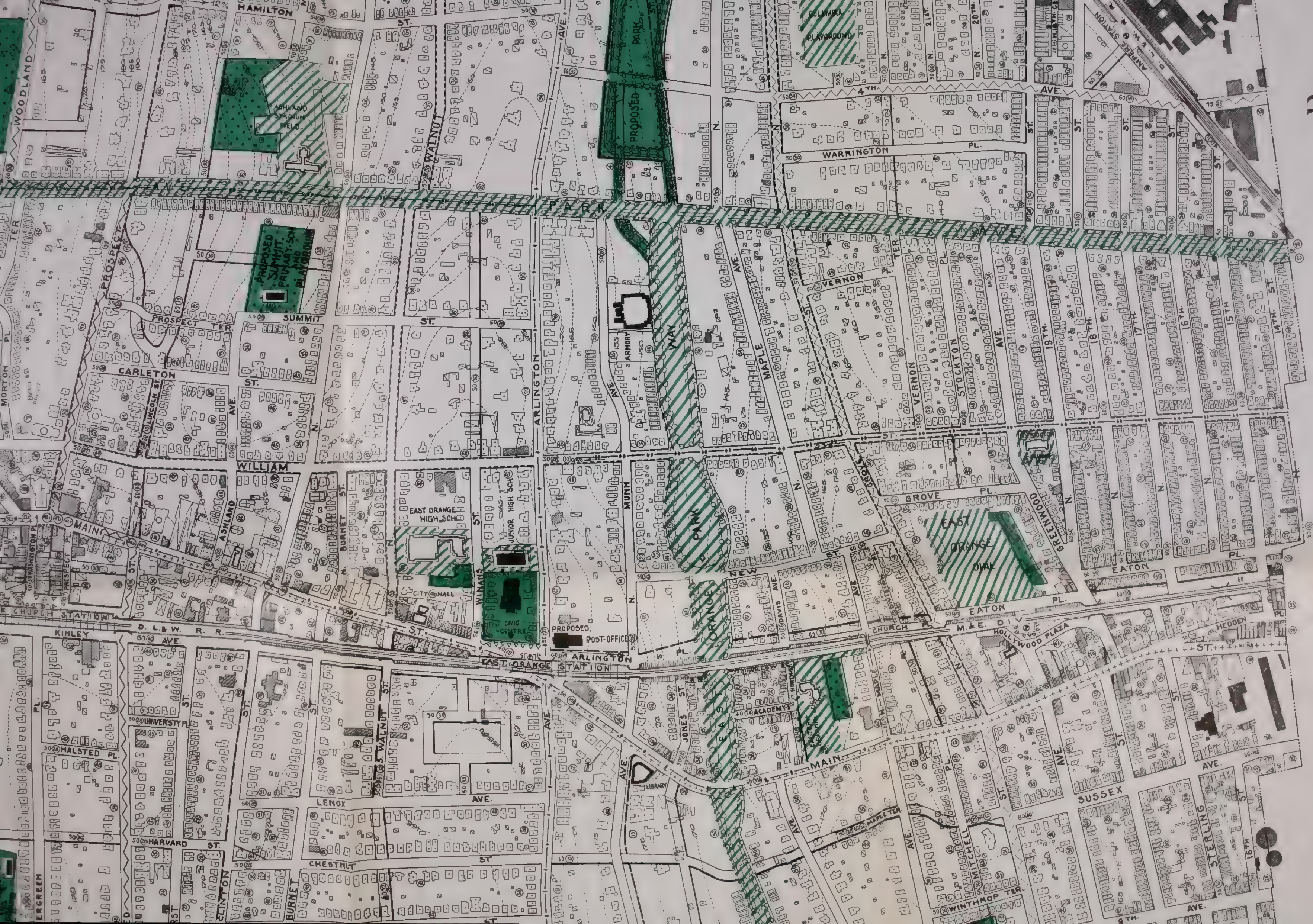
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R



KEY

THOROUGHFARES AND STREETS

Widen street & roadway on one side only

Widen roadway only on both sides

New Street or Extension

Grade

New roadway width

Old roadway width

New street width

Old street width

One way

Width of parkway & 'dway

Width of parkway

STREET CAR LINES

+++++

JITNEY LINES

~~~~~ Existing

~~~~~ Proposed

RAILWAYS

Old New Solid

Bridges

Embankment open cut

Supported with retaining walls on bridge construction

AUTOPARKING

△ △ △ △ Proposed

PARKS & PARKWAYS

Parks Parkways

old new old new

PLAYGROUNDS

Old New

CEMETERY

+++++

PUBLIC BUILDINGS

Old New

SCHOOLS

Old New

MONUMENTS

Old New

LAND VALUES

+

EXISTING USES

1 Family 2 Fam. 3 Fam. or more

Institution

Church

Priv. garage Public garage

Business & storage

Industry

Amusements

R.R. Stations

Tenement over store

Public property

Other unclassified buildings

CITY & WARD LIMITS

City

old ward lines

1921

CONTOUR LINES

125

150

175

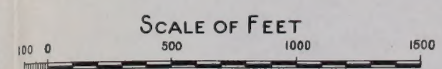
5 feet





CITY PLAN
MAP
OF
EAST ORANGE
NEW JERSEY

CITY PLAN COMMISSION



TECHNICAL ADVISORY CORPORATION
CONSULTING ENGINEERS
NEW YORK

- 1921 -

UTL AT DOWNSVIEW



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